The Builder.

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Mineral Statistics.

THE annual Blue-book* on our mineral statistics is always an interesting document, full of surprises, and figures of great practical value. We have in former years published short critical articles on it, and have had the satisfaction of watching the evolution of improvements in the method of presentation of the statistics, especially in regard to those minerals of chief interest to our readers. The Report for 1895 was more or less an experiment, in the sense that a new complexion was enabled to be thrown on the figures relating to the stone industry, as the Quarries Act had just come into force. By 1896 things had naturally become more settled, and we regret to see that what we had thought to be mere tentative arrangements incidental to dealing with a mass of new statistics have been adopted a second year, and have, therefore, to be regarded as more or less permanent. The heading "Stone, &c.," with its odd jumble of minerals, has, fortunately, disappeared, and in its place we find headings relating to "granite," "gravel and sand," "limestone (other than chalk)," "sandstone," and the like. This arrangement is a decided improvement, but we shall show that it does not go far enough and might be considerably amended to advantage. The figures will never possess their full value until those who collect the returns understand what the material they schedule is used for. We may add, that if the Acts at present in force are not strong enough to enable this information to be collected and published in some form, then they must be amended and more power given to inspectors. And now to proceed to the consideration of the statistics.

Next to coal, stone, in various forms, is the most important raw mineral industry in the country. Let us commence, therefore, with the different varieties of stone scheduled.

Granite.—The compilers begin by stating that "the term granite is applied very vaguely in commerce, and consequently some of the stone so called in the returns furnished to the inspectors is not entitled to that name when used in the strict geological sense. The diorite and quartz porphyry of Carnarvonshire, often sold as granite, are, nevertheless, separated in these statistics, and are included under "Whinstone, Basalt, &c." Of the quartz porphyry we have nothing to say, but why the diorite should be excluded in the manner indicated we know not. A large quantity of stone included in these statistics as "granite" is not more closely allied to that rock (*sensu stricto*) than is the diorite alluded to.

Then follows a sentence which we are quite at a loss to understand:—"Some quarry-owners even apply the name granite to hard grit or sandstone; *as far as known*,* all returns of this description have been relegated to their proper place under the heading 'Sandstone.'" Are we to understand that those who are responsible for the compilation of this work have no means of ascertaining whether the produce of a certain quarry is granite or sandstone? Cannot the inspectors tell the difference between these two elementary rocks? And this in an official publication too!

We glance down the granite returns. What sort of "granite" comes from Yorkshire and Somerset? Why is there no attempt to classify the granites according to their uses? Here we find the beautiful blue "granites" of Aberdeen, used very extensively for monumental and polished work, placed side by side with the rough hornblendic granites, syenites, and altered diorites of Leicestershire used almost exclusively for surveyors' purposes. The "granites" from Aberdeen and Leicestershire have nothing in common save that kerbs and pitchers are made in both districts. To a large extent the trades are different, and the mineral is certainly different.

Taking the figures as they stand, however, we learn that during the year, Cornwall produced granite of the value of 38,002*l.*, Cumberland 21,650*l.*, Leicester 219,776*l.*, Aberdeen 117,505*l.*, Argyll 17,336*l.*, Kirkcudbright 34,999*l.*, County Down 10,675*l.*, and some other counties yielded a smaller quantity. The total figures for granite for the United Kingdom for the year are 1,756,816 tons, valued at 498,074*l.*

Sandstone.—The counties of Lancaster, York, Glamorgan, Edinburgh, and Lanark are the chief producers. The totals for the year are 4,507,745 tons, valued at 1,417,985*l.* These figures include ganister from the Coal Measures, and also part of the stone returned as "freestone." No attempt is made to classify the sandstones, either according to their geological age or to specific uses. We have, therefore, the sandstones used by the architect mixed up with those exclusively employed by the surveyor.

Limestone.—The compilers remark that even without taking chalk into account, limestone appears to be the most important mineral which is quarried in this country, "Its uses are so various, and it is found so abundantly, that this fact need cause no surprise; it is wanted by the farmer, the builder, the iron-smelter, and the chemical manufacturer." That is perfectly true; yet in these returns no attempt is made to estimate the quantities and values that are to be assigned to the users mentioned. The immense quantities of limestone burnt in the manufacture of lime are inextricably mixed with that used for building purposes, thus we are quite unable to ascertain from this Blue-book as to the relative production, and so to ascertain whether there has been any falling off or increase in any particular section. What is the practical value of mineral statistics unless they enable us to judge of such matters as these? The totals for the year are—11,011,350 tons, valued at 1,215,604*l.*

Chalk.—"Kent is by far the most important chalk-yielding county, and much of its produce is employed in the manufacture of Portland cement at works on the banks of the Thames and Medway." The total output for the United Kingdom during the year was 3,559,229 tons, valued at 157,170*l.* Of this, Kent is responsible for rather more than 2,365,541 tons, valued at about 94,100*l.* Essex and Hampshire are the next important producers.

Whinstone, Basalt, &c.—This section includes igneous rocks not referred to under the heading of "granite," and practically all the stone is used for road metal and paving purposes. The enormous quarries in Carnarvonshire yielding 385,494 tons, valued at 112,867*l.*; Shropshire, 190,979 tons at 26,874*l.*; Staffordshire, 159,953 at 36,476*l.*; Warwickshire, 198,034 at 29,505*l.*; York-

* "Mineral Statistics of the United Kingdom for the year 1896." London: 1897.

* The italics are ours.—ED.

shire, 89,629 at 21,176*l.*; and Lanarkshire, 116,505 at 21,753*l.*, produced a large quantity of the stone raised. The totals for the United Kingdom are 2,286,999 tons, valued at 425,587*l.*

Gravel and Sand.—Here we have two totally distinct substances, from the point of view of their uses, classified under one heading, and the figures hopelessly muddled. The counties producing the most are Bedford, Cheshire, Derby, Essex, Hertford, Kent, Lancashire, Norfolk, Nottingham, Stafford, Surrey, Sussex, Warwick, Worcester, York, and Lanark. The totals for the year are 1,268,310 tons, valued at 90,020*l.*

Slate and Slate Slabs.—The disturbances in North Wales towards the end of 1896, whereby one of the principal slate quarries in the country was closed, did not prevent the figures for the year from being higher than in any previous year. There has been a steady rise in the value of slate raised since 1891, when the returns were 415,029 tons, valued at 987,000*l.*, until 1896, when 586,933 tons valued at 1,338,256*l.* were recorded.

Chert and Flint.—Chert is principally obtained from Derbyshire and Flintshire, which counties supply the Potteries with the stones for grinding up the materials from which china is made. Most of the flint is from chalk quarries. The totals for the year are 107,967 tons, valued at 17,030*l.* It is interesting to note that the mining of flint for the manufacture of gun-flints, which are "exported to savage countries," is still carried on at Brandon, in Suffolk, and during the year no fewer than 4,399,000 gun-flints were turned out. The quantity of flint raised on this account, however, was only 278 tons, valued at 36*l.*

Quartz.—One return only from Argyllshire, where 519 tons valued at 389*l.* were obtained.

Slag.—A recent legal decision has shown that excavations in old slag heaps are not quarries in the meaning of the Quarries Act, so that, in future, "slag" will disappear from the returns. At the same time we may note that, during 1896, no fewer than 562,293 tons, valued at 15,358*l.*, were obtained. It is gratifying to note the active working of these unsightly heaps which, in consequence, are gradually disappearing in certain districts, to the general improvement of the country round. The principal use of the material is as road metal.

Gypsum.—This mineral is raised principally for making plaster of Paris and Keene's cement; fine monoliths, as alabaster, are also obtained for decorative purposes. Nottinghamshire and Staffordshire are the two principal counties from whence gypsum comes. The totals for the United Kingdom for 1896 are given as 193,311 tons, valued at 74,538*l.*, a slight increase on the production of the previous year.

Ochre, Umber, &c.—The compilers observe that some of the ochre of Anglesey is obtained from a native earth dug up from shallow pits, and a considerable amount is deposited by the ferruginous water from the copper precipitation pits, when exposed to the action of the atmosphere in shallow ponds. Ochre and umber are obtained principally from the counties of Devon, Gloucester, Somerset, and Anglesey. The output for the year was 9,891 tons, valued at 24,688*l.*; used very extensively in the preparation of paints.

Clays.—Totals for 1896, 11,341,782 tons, valued at 1,442,069*l.*

We need not discuss in detail the returns relating to metals or coal, no new features are presented. It may be remarked, however, that coal, arsenic, copper, tin, and uranium all show a falling off in value as compared with 1895; whilst iron ore and lead ore show considerable improvement in that respect.

The total value of all minerals scheduled for the year 1896 is 69,088,366*l.*, as against 69,133,164*l.* for the previous year.

The figures just given by no means represent the value of the *whole* of the minerals raised in this country, and those who make comparisons with the annual mineral output of the United Kingdom and that of other countries should bear this in mind. The returns are certainly not inflated, and the figures as a whole are as accurate as the Acts of Parliament at present in force allow them to be. But these Acts do not go far enough to enable us to obtain full figures in reference to certain minerals. In all cases where a quarry is less than 20 ft. in depth, the owner thereof is not compelled to furnish a return to the inspector, as his working does not come under the Quarries Act. This operates very disastrously in the case of shallow clay workings, and it is safe to conclude that the figures relating to clay are very much lower than they would be were every clay-owner compelled to make a return, no matter whether the face of his working were less than 20 feet in depth, or more. The same observation applies to stone quarries, and gravel and sand pits. Taking these things into account, it is possible that the total annual value of raw minerals (within the definition adopted by this Blue-book) raised in the United Kingdom would amount to at least 73,000,000*l.*

Glancing at the statistics as a whole, they are remarkable for the absence of uniformity in the method of presentation; the subjects should be balanced more evenly. An illustration will serve to make our meaning clearer. Under the heading "Coal" we find not only a summary of the production of coal by counties (particulars of individual returns are not allowed to be given), and a table giving the output of coal in the United Kingdom since 1873, but the table also includes the quantity shipped for foreign countries in the form of coal, coke, and patent fuel, &c. Then there are tables giving the prices of coal per ton at the pit's mouth, in the London market, and at the principal shipping ports in the kingdom. After this information there is a schedule of coal and coke conveyed by railway, canal, and other inland navigation companies, and by sea. Particulars of exports follow, the whole being set out in much detail.

Contrast this excellent return relating to coal with that referring to granite, limestone ("the most important mineral which is quarried in this country"—as the compilers truly remark), sandstone, and the like, and we find that the last-mentioned minerals are treated with but scant courtesy, summaries of production by counties only being given. It is much to be regretted that no particulars are given in reference to exports and imports, for they would certainly open the eyes of stone merchants and the public, and show how slowly but surely the foreign granite merchant has taken foothold in our principal markets; whilst at the same time we should be able to get some idea of our granite trade abroad. To this criticism it may be answered that we can consult other returns such as those published piecemeal by the Foreign Office in the shape of Consular reports, by our own Board of Customs, the Board of Trade, or by consulting the statistics of foreign countries, in order to learn the state of our own trade. And that is precisely what we have to do, but the process is a very unsatisfactory one. The Consular Reports are not all drawn up on one plan, and particulars such as we require are often wanting; and we have yet to learn that it is desirable to consult figures published abroad. Such particulars as we ask for are published in reference to coal (as we have remarked), also to iron, copper, zinc, and a few other minerals, in the Blue-book under review. The raw stone raised is more important as regards value than the metals alluded to. Why not give them at least the same consideration? If it is contended that most of the stone exported is manufactured first, and that particulars concerning it ought not to find a place in these returns, then we must ask for the rigid exclusion of all "manufactured minerals" from this Blue-book. If patent fuel receives attention, so ought artificial stone, which is daily becoming more important. At present we have no means of ascertaining in what way the manufacture of artificial stone is affecting the quarrying of natural stone; it would be interesting to have some information on that head also.

Then, the method of classification of minerals adopted in this work is susceptible of much improvement. At present the general arrangement is alphabetical, the particulars referring to closely-related substances being placed in different parts of the book. Thus, limestone is sandwiched between lead ore and manganese ore, and fluor spar is found between copper precipitate and gold ore. We would suggest the following classification as being more natural:—First, to divide the minerals raised into two broad groups—(*a*) metals and (*b*) non-metals. The first group (*a*) may be divided into "iron ore," "lead ore," "copper ore," &c. In cases where it can be conveniently done, these should be sub-divided. Thus, iron ores may be dealt with as (1) limonite, (2) hæmatite, and so on. This last sub-division is attempted in part by the present arrangement, but the fact that it is not adopted throughout in regard to iron renders the results of but little value.

In reference to the non-metals (*b*) the general arrangement might run somewhat as follows: Such substances as jet, salt, coal, and fluor spar might well be dealt with under separate headings. But for the most part we should prefer a geological classification into aqueous, igneous, and metamorphic, for the bulk of the remainder. Under this arrangement sandstones and limestones would be found near each other; the igneous could be divided into holocrystalline and volcanic rocks; and slates, quartzites, and the like would be dealt with in the metamorphic division. In a general way this would bring all "stone" together, which would be much more convenient than by the present method of arrangement. But we would ask for more than this. Under the heading "Limestone," we should like to see sub-divisions showing how much of that mineral was utilised for making lime, or cement, and the

proportions used for building stone and for agricultural, chemical, and metallurgical purposes. That is not dealing with "manufactured minerals," but with raw materials only. The same for the holocrystalline igneous rocks—granite, syenite, and diorite; only that in this case we should like to know how much was employed respectively for road metal, kerbing, and general surveyors' purposes, and for building stone. In calculating the value, we should not, of course, deal with the cost of any manufactured article, which would enormously inflate the returns, and not give a true account of our mineral output and its value. If we did include a manufactured article—artificial stone, for instance—particulars would be given as an item of information only; we should not admit the figures relating to it in the general totals, unless the mineral matter of which the stone was made was not recognised in dealing with that class of mineral matter in its raw or unmanufactured state.

Now, in proposing this classification we are not by any means extravagant. The method we foreshadow is different to that adopted by any foreign country, but is by no means as detailed as that of the United States, where specialists are employed to deal with each group, the whole being placed under a general editor. What we principally object to in the United States method of handling the statistics of their "Mineral Resources" is the general tendency to include manufactured minerals in the general totals giving value. But we like the occasional articles showing the mode of "getting" the raw minerals and special modes of dealing with these latter; also the causes for the rise or decay of the mineral industry in any particular district, and the suggestions for improvement where desirable. This might be copied to advantage by the compilers of our own Mineral Statistics, and we are not sure but that such was not contemplated in the recommendations of the Royal Commission upon Mining Royalties which were indorsed by the Departmental Committee upon Mining and Mineral Statistics, though these recommendations demanded a separate general report upon the mining industry of the country. Such reports have since appeared,* and the circumstance that they were prepared by such an authority as Dr. C. Le Neve Foster is a sufficient guarantee of their excellence.

It is impossible to do much in the direction indicated without adequate staff and money to carry out the work, and we suspect that the real reason our Mineral Statistics are dealt with in the perfunctory manner they are in many ways, is the lack of "sinews of war." Indeed, that would seem almost certain from the following sentence in the Introduction of the book under review, namely:—"The number of separate quarries is so great that the individual returns could not be published without enormously increasing the size of the book. For this reason it has been thought desirable to publish only the totals for counties." If our surmise is accurate we can only say it is high time that sufficient money was devoted to the purpose. We ought at least to know as much about our mineral output and resources as do those foreign Powers who are sparing no pains to develop and disseminate knowledge concerning theirs. We have reason to believe, from the results, that the learned compilers of our Mineral Statistics are severely handicapped, and that many of the anomalies we have pointed out would not exist had matters been otherwise. The Treasury must be reminded that our mineral wealth is the "backbone of the country," and particulars concerning it must not be dealt out in a niggardly fashion.

* First Annual General Report, Mineral Industry of the United Kingdom for 1894; Second ditto for 1895; Third ditto for 1896 (Blue-books).

NOTES.

The Engineers' Strike.

IT is obvious that we are now watching the end of the engineers' strike. The withdrawal of the London demand for a forty-eight hours' week is the signal of the men's submission. It is difficult to write on the actual conditions of the struggle, since it is changing from day to day, but it is clear that the bad time for the strikers has now arrived. There is all the appearance of a break-up in their ranks. The Clyde men are said to contemplate a separate organisation; this may not be true, but the rumour indicates dissatisfaction. Places have been frequently filled up by non-unionists, and many unionists are now beginning to realise that even when the strike ends they may be unable to find work. It is probable also that, so many contracts having been placed abroad during the strike, the volume of business will be for some time less than before the strike. We are, in fact, near the melancholy spectacle of an industrial *débacle*.

New Academicians.

ARCHITECTS will be glad to hear that Professor Aitchison, A.R.A., the President of the Institute of Architects, has been elected R.A., an honour well merited, in recognition of his exceptional knowledge of and taste in architecture, and the important influence which his lectures on architecture at the Royal Academy have exercised on the minds of students of architecture old and young. Mr. E. J. Gregory, A.R.A., has also been elected R.A. His learning and power in the technique of painting fully justify the choice, even if we find his works somewhat devoid of inspiration. Technical power in painting is what an Academy of Art can teach and can form an accurate judgment of, and therefore it should be an essential point in the election of Academicians, and that is the real answer to the charge sometimes made against the Royal Academy of having improperly neglected and kept outside of its doors some painters of great power as colourists or as imaginative inventors in art, who nevertheless were bad draughtsmen: Rossetti is one instance. The new Associates are Mr. H. H. La Thangue, whose election will be generally approved, and Mr. Lionel P. Smythe. The latter choice seems rather like a concession to the side of impressionist painting, and there may be some difference of opinion in regard to it.

Treasury of Cnidos at Delphi.

AT a recent meeting of the Ecole Française at Athens, M. Homolle expounded his view that the Treasury at Delphi, which, since its discovery, has gone by the name of the Treasury of the Siphnians, was in reality dedicated by the Cnidians. The building, it will be remembered, was described in some detail in our issue for June 8, 1895. The change of name has resulted from the further progress of excavations, and is, of course, of considerable importance for the history of art. The main reasons for the change are as follows:—1. The three honorific decrees inscribed on the anta belonging to the treasury all relate to the Cnidians. 2. The dedication is in an archaic alphabet characterised by two letters known only in the system in use at Melos and Cnidos, *i.e.*, C half circle for *o* and *o* for There is a further argument *a silentio*. Among the numerous inscriptions with which the interior of the walls were covered none occurs later in date than the second century B.C. Mr. Barclay Head, in his catalogue of the coins of Cnidos in the British Museum, has remarked on the paucity of coins issued after B.C. 167, and quite independently he concluded that the city about that date sank into insignificance. The new plans of the whole precinct of Delphi will shortly be published, and we propose then to give a detailed account of the results of the last two years' excavations.

Mr. Watts's Statue of "Energy."

IT is gratifying to learn that Mr. Watts intends to present to the nation his colossal equestrian statue of "Energy" and that it is to be cast in bronze at the expense of the Treasury; but the statement that "an admirable site has been found for it in Hyde Park in the centre of the terrace at the foot of the Serpentine," is more questionable. In whose judgment is this "an admirable site?" Not in ours, certainly; the space is far too narrow; a colossal work like that requires a considerable space in front of it to be estimated properly; if it is crammed up in that comparatively narrow terrace no one will get a proper view of it, except a too distant one. The site is quite a mistake, and ought to be re-considered. We should very much doubt if Mr. Watts himself would feel satisfied with it.

The Spoiling of Stratford-place.

IF the scaffolding up before one of the houses on the east side of Stratford-place means, as we understand it does, that this house is to be raised, breaking through the range of cornice and balustrade at this point and spoiling the continuity of the design, we can only say that those who are doing this are selfishly spoiling a remarkable piece of London street architecture for their own advantage, and it is much to be regretted that there should be no authority with power to stop such a stupid piece of work. Stratford-place is unique in London; it is the one example of what may be called monumental street architecture we have, designed by an architect whose name has gained a permanent place in the history of English architecture; and that a single owner or tenant should be allowed to destroy the effect (and in this sense the alteration of a single house is as bad as the alteration of half a dozen) is a thing that there ought to be some means of preventing.

Proposed Railway Bridge at Paris.

THE "Ouest" Railway Company are proposing to build a bridge over the Seine, with iron girders more than eight mètres in height, to carry their new line from Courcelles to the Champ de Mars. It is considered, and no doubt rightly, that this

would very much injure the view along the river, and the official representatives of the city are entering a protest against it to the Minister of Public Works, who has promised not to approve any design which will not satisfy all the interests concerned. This will be rather difficult; but it is noticeable that in Paris such a point is considered of importance by the Government, and it is expected that they may even refuse their consent to the bridge. In London it would be considered a matter of no consequence.

The Site of the Cripplegate Fire.

THE recent fire in the Cripplegate district has given the City an opportunity for promoting some street improvements, and pressure has been brought bear on the Corporation, as well as on the London County Council, to take up the matter. The reasons for the improvements are not difficult to find, as they primarily comprise the necessity of reducing the risk of a fire spreading over narrow thoroughfares, and the further necessity of affording better traffic facilities in a very congested area. The initiative seems to have come from a Special Committee of the Cripplegate Ward, whose operations commenced on December 21, and who on Wednesday last reported their recommendations to a general meeting of the ratepayers, convened with the special purpose of strengthening the Committee's hands. At this meeting it was evident that the Committee had already considered a number of plans on broad lines, but had determined for the present only to press for some improvements on the area actually affected by the fire. Jewin-street, they consider, should be widened to 60 ft. and Wells-street and Hamsell-street combined as one broad thoroughfare of similar width, and continued to Red Cross-street. These improvements are proposed with due regard to further schemes for joining up Wood-street, and prolonging Jewin-street to the Cattle Market. With the exception of a few details, the ratepayers were unanimous in adopting the Committee's proposal, which were very ably explained by the Chairman, Sir Henry Knight. Improvements as suggested at present are, of course, merely a question of finance and promptness. Those in authority will have to show more than usual activity if they are to come to a decision before building operations are commenced on the Cripplegate area on lines identical with those previous to the fire. As to finance, negotiations should be greatly simplified by the fact that only one ground landlord has to be dealt with, *i.e.*, the Goldsmiths' Company, who are treating the matter in a very liberal spirit.

Provincial Fire Brigades' Bill.

THE "National Fire Brigade Union" proposes introducing a Bill next session dealing with fire brigades generally throughout the country, excepting those already constituted by Act of Parliament. The Bill deserves the support of those interested in fire protection, for, without advocating any measures which might collide with such interests as those of the insurance companies, certain practical requirements are defined which must tend to increase the efficiency of the fire service. At the present moment there are still many fire brigades which, in organisation, equipment, and discipline are practically useless. If the Union Bill becomes law, a Local Government Board's certificate as to efficiency will be essential for any force which is to have the recognition of the authorities. Further, we find that there will then be more pressure upon the Local Councils to have well-equipped brigades at their disposal. At present many of our authorities are very dilatory in this matter. There is another point he would here touch on when speaking of provincial firemen—that of uniform. The Fire Brigades Committee of the London County Council wish to stop the wearing of uniforms in London which are in any way similar to that of the Metropolitan Fire Brigade. Considering that this uniform is the recognised equipment of nearly the whole of the firemen in Great Britain, the Union was naturally indignant, and we are glad to see that they are taking steps to stop the action of the Committee.

Bicycle Storage.

WE have, from time to time, heard that bicycle accommodation for storage has become essential in many buildings, but, as a rule, architects have been satisfied in providing some sheds or an outhouse for the machines. It is hence a sign of the times to find that the opening article in the new year's number of the *Deutsche Bauzeitung* deals with bicycle stores, with special regard to factories and places of public entertainment. The illustrations to this article show a model cycle-store for two hundred machines, stacked on two floors, *i.e.*, a semi-basement and an entresol. The method of compact storage is in form of racks which are open to gangways on both sides, and into which the machines are slid in such a manner back to back, that four only take the space usually occupied by two. They are brought down to the basement, and up to the entresol by staircases with sliding grooves on either side. We observed last year that the Earl's Court Exhibition provided bicycle accommodation, and we are sure it will soon be found a necessity in many other large places of amusement. The leading factories of the Continent, we believe, have had them for some considerable time, and some of the large offices have adapted their basements for the purpose. The model cycle-store illustrated by our German contemporary is the result of a competition under the auspices of the Berlin Architekten-Verein, which, as we have noticed before, always keeps well abreast of the times in such matters. The author of this model design is Mr. Carl Bernard, who was awarded the first premium.

The Constitution of Hydraulic Cements.

MESSRS. NEWBERRY have been carrying out an extended series of experiments with a view to ascertaining whether it is possible to find a general formula which will indicate the amount of lime which should be added to any clay to give the best result in the manufacture of hydraulic cement, and also what effect the oxide of iron in the clay has upon the cement. Experiments were also made to ascertain the effects of soda in the raw materials, as the artificial addition of alkalies is often recommended in the case of materials naturally deficient in them. The possibitity of the replacement of a certain proportion of lime by the magnesia in the clay was also made the subject of experiment. The results of their experiments are given in a paper communicated by them to the New York section of the Society of Chemical Industry, and readers interested in the scientific aspects of hydraulic cement manufacture will do well to refer to their paper. The conclusions arrived at by Messrs. Newberry are summarised as follows:—1. The essential constituents of Portland cement are tri-calcium silicate, with varying proportions of di-calcium aluminate, and the theoretical weight of lime to be added to a clay to make Portland cement is found by multiplying the silica by 2·8 and adding to this figure the amount of alumina multiplied by 1·1, thus:—Lime required $=(Si\,O_2 \times 2{\cdot}8)+(Al_2\,O_3 \times 1{\cdot}1)$. 2. The iron oxide in the clay need not be considered in calculating the proportion of lime required. That, although at a high heat the iron oxide combines with lime, and acts like alumina in promoting the combination of silica and lime, it may in practical manufacture be disregarded. 3. Soda is of no value in promoting the combination of lime and silica, and probably plays no part in the formation of cement. 4. Magnesia also probably plays no part in the formation of cement, and is incapable of replacing lime in cement. No attempt was made to investigate the injurious effects of considerable percentages of magnesia, because that matter is being exhaustively dealt with in Germany.

The Banqueting House, Kensington Gardens.

ON January 12, 1895, we published Mr. G. Weald's set of measured drawings of this structure, which stands along the north side of the private gardens attached to Kensington Palace. In accordance with the scheme initiated by the Queen for giving the public admission to the Palace state-rooms* an estimate, to be submitted to Parliament by the Office of Works, will provide for a "restoration" of the Banqueting House, which, it is believed, was designed by Wren. To what we said three years ago upon the style and character of the building in question, we may add that of late years it has been shamefully misused, having been made to serve as a store-house for plants, gardeners' tools, barrows, and lumber. In his letter printed in the *Times* of December 11, 1895, the present President of the Royal Academy directed attention to its sorry condition. Moreover, six windows, of different sizes, have been inserted in the north wall, their varying heights being cut to suit the levels of some sheds built against the wall, whilst within, much of the panelling and carved mouldings of the north wall was cut away for shelves and pot-bins, and the original ceiling of the central compartment has, it appears, been removed. There can be little doubt that in the original design it was intended that the apartment should be lighted by only the south range of windows, with those of the two end ante-rooms. It is built of red and brown brick.

Sir John Gilbert's Works.

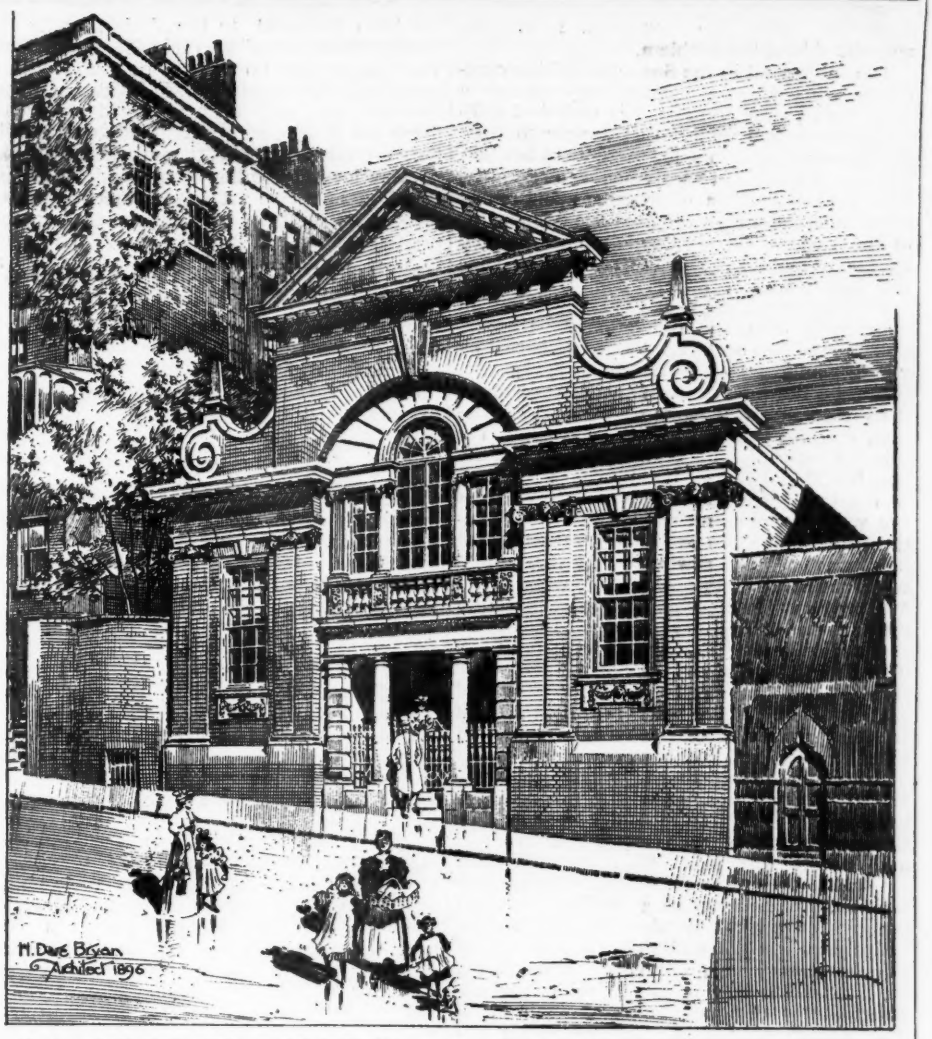
THE Society of Painters in Water Colours have got together a fine collection of the works of the late Sir John Gilbert, sufficient to fill the room. There is even less variety in these than we expected to find; Gilbert found his characteristic style and type in art, the thing that he could best do, early in his artistic life, and (in his works

* See our "Note," pp. 52-3, *ante*.

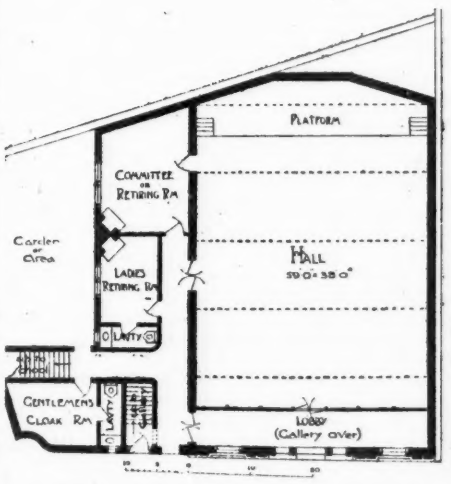
in water-colour at least) hardly ever departed from it. In his first exhibited drawing, "The Arrest of Hastings," painted in 1835, he had not acquired his broad full style of handling, and the expressions of the faces are somewhat exaggerated, though the action of the whole group is very energetic and dramatic. In his matured works he got rid of all over-emphasis in the expression of his figures (unless it may be in his "Malvolio," a subject rather out of his usual line); they were subordinated to the general effect of the scene, in which, in the open-air pictures (which form the majority), the landscape and figures always seem completely to belong to each other; of this harmony in the whole picture "The March of the Army" (3) is one of the best examples. It must be admitted that the figures in this and other works of the same type have little personal or human interest; they are "figures," in a pictorial sense, and nothing more; but the total effect is nearly always striking and full of vigour and movement; and if there is a good deal of repetition of effect and *motif*, at all events the painter had achieved a well-marked style of his own. His frequently fine and broad treatment of landscape has perhaps not been sufficiently recognised; but such works as "Gypsies Crossing a Heath" (8) and "Asking the Way" (55) may stand simply on their merits as landscapes, apart from the figures. The collection includes a good many charming sketches, mostly monochrome, of bits of architecture, which Gilbert seems to have studied a good deal, though he seldom made any use of it in his finished pictures. The fact that the collection was confined to water-colours explains of course the absence of one or two of Gilbert's very best works, especially the "Arrival of Wolsey at Leicester," a picture superior in human interest and pathos to the type of work by which he was best known, and which made one regret that he did not oftener step aside from "the buff-jerkin business."

Society of Miniature Painters.

THE third annual exhibition of the Society of Miniature Painters, at the "Modern Gallery" in Bond-street, is as successful and as well filled as the previous ones, and shows that we have a considerable number of artists among us now who can practise successfully this pretty and attractive form of portrait painting; for it is to portraiture that the art is chiefly directed, and in which its chief value lies. In regard to the more realistic (and sometimes hard) type of miniature portraits, the main object, of course, is to supply a faithful likeness of a person on a small scale and in a kind of ornamental manner; one artist, Miss Rogers, in fact, has produced a portrait of a child which would go into a setting in a finger ring, if desired, the face being hardly more than one-eighth of an inch in width; but this is rather a curious experiment than an illustration of miniature painting at its best. It is possible, however, to impart to a miniature head a very idealised effect, by softening down adjuncts and avoiding hardness and over precision; as in Miss Lewis's "Vera" (168), and Mr. Alyn Williams's "A Portrait" (251), and Mr. Sauber's "Une Belle" (90), a very good bit of colour, and very graceful in line. Among the more realistic order of portraits Mr. Rinzi's portrait of himself (49), Mrs. Debille-mont-Chardon's "Miss M.C." (38), Miss Bethell-Gibson's portrait of the Queen (96), Miss Hope Thomson's "Miss Plowden" (108), Miss Lee Hankey's "Ivor" (88), and Mr. Cecil Hobson's "Portrait of a Child" (104), are among the best we noticed. The Society, it may be added, has made arrangements for keeping a permanent collection of miniatures open at its Gallery, each member having the right to have three representative miniatures on view throughout the year.



Proposed Hall for School of Art, Berkeley-square, Bristol. Mr. H. Dare Bryan, Architect.



Proposed Hall for School of Art. Plan.

Roman Remains in Paris.

THERE has recently been discovered in the Île de la Cité, near the Morgue, the remains of a portion of a Roman wall, of which the footings and the first three courses of the wall are intact. The footings are formed of very large rough-hewn blocks of stone; and the wall itself, a little more than two mètres in thickness, is built in coursed masonry of large stones without mortar. It is locally considered that this is undoubted Roman work, and a part of the wall of the ancient Lutetia. The stones will be preserved either in the Carnavalet Museum or in the Salle des Thermes at the Cluny Museum. Apparently it is not possible to leave them *in situ*.

PROPOSED HALL, SCHOOL OF ART, BRISTOL.

THIS building is shortly to be erected at the rear of the School of Art, in Berkeley-square, Bristol. The design is of Georgian character in keeping with its surroundings, and the materials to be used are red brick and Bath stone. The architect is Mr. H. Dare Bryan, of Bristol.

STUDENTS' DRAWINGS AT THE INSTITUTE.

As the years pass and January comes round, those who have nominally passed their student days may well look with considerable interest to these annual exhibitions of students' work to reveal to them something of the fresh ideas which are for ever following on one another's heels with every fresh generation of architectural students. And they may legitimately expect to see some designs that will help them to form or strengthen their opinion of the value of those fresh ideas. This year it does not seem to us that the students' work answers this expectation in any marked way. The average of ability in the designs is lower than usual, and drawing does not appear to have made any distinct move in any direction. The best competitions are those for the Tite prize and Grissell Medal, but in the former few competitors seem to have been able to give equal attention to the villa and the garden, or to treat them together as part of one design; and in the latter most of the competitors have

neglected either the constructive or the æsthetic side of the problem.

The subject set in the Soane Medallion competition this year—a concert hall—though a good one in some respects, has technical difficulties connected with it that appear to have frightened competitors, for there were but five, and one of those can hardly be taken seriously. There is a suggestion of humour about one of the conditions, which requires the regulations of the London County Council to be observed *as far as possible*. Are the regulations such that they cannot be entirely complied with, or are the other conditions of the competition incompatible with the regulations? Unquestionably the best architectural design is that by "Pan," and, taken as a whole, it is also, probably, the one that would most commend itself to a practical manager for accommodation, convenience, and safety. Whether the internal ratio of length to width is quite the best is a little doubtful, but it makes the most of the site given, and the entrances and exits are well planned and sufficient. The elevations and perspective are strongly reminiscent in character and drawing of the design that was successful in this competition last year, and, without being equal to that charming little market-hall, it has the merit of distinction and of looking like what it is intended for. The design under the quaint device, "34° South," also has merit; the proportions and seating of the hall are better arranged than in the last named, and the entrances are on the balcony level which, other things being equal, makes shorter exits from the upper levels. This advantage seems thrown away in this case by cramped and complicated planning; the elevations are much below the average, and hardly less fussy than the drawings by which they are presented. "Quod erat faciendum" has planned a nearly square hall occupying the whole width of the site, with a "royal box" projecting into the middle of one side in a very unhappy way. Outside the building looks like a temple with a small, unfortunately designed turret crowning the main pediment. "Lyra" has planned a circular room that more experienced hands might perhaps have made something of, in an architectural sense; but the circular form is one of the worst for a concert-room, unless it be intended solely for instrumental music, with the band placed in the centre.

The fascinating subject of "A Villa and Ornamental Garden" has brought out the unusual number of nine competitors for the Tite prize, who have produced several excellent designs, between which the prizes committee must have found it very difficult to choose. Mr. J Stevens Lee, who gains the prize, has adopted, in both the house and garden, a treatment simple as compared with most of of the others, and his drawings are weak and by no means striking at first sight. The house is a plain rectangle, built round a top-lighted hall of one story high only, and with a wing, also of one story, containing a conservatory, billiard room, and some rather cramped offices. It is conveniently planned, but the bath room over the drawing room is a blemish. The elevation shows only equally spaced rectangular windows, a low roof with broad overhanging eaves, and a long projecting portico of the Roman Doric order. The principal feature in the garden is a large circular pool of water surrounded by steep grass slopes and flights of steps leading down from higher levels, where there are a flower garden and a tennis lawn. A medal of merit is awarded to Mr. Thomas A. Pole for a rather more ambitious effort, which has produced a straggling but otherwise very well planned and pleasing house, and a fairly good but too broken-up garden. His chief success has been in raising the building considerably above the garden. By far the best garden is that submitted under the device of a triangle in a circle; the house, too, is pleasing, and not ill planned, and the perspective drawing is a very powertul one. It is not quite easy to see why this design has been altogether passed over, unless it was considered that the garden was an English rather than an Italian one, or some minor faults in the plan of the house became exaggerated in the minds of the committee. "Lorenzo" submits a very cleverly planned and pleasing house, and summarises his ideas in a good water-colour drawing, but he has rather thrown away his chances as regards the garden to get a short and inadequate avenue on the entrance side.

The grounds upon which the Grissell Medal has been awarded to the design under the motto "Slavekircke" are difficult to understand. There is perhaps no fault to be found with it except that it is commonplace in idea and construction, and very inadequately drawn. But there are at least two designs superior to it in these respects, and one, that marked "Emce," not inferior in the fullness with which the construction is shewn; it is true that rough-cast instead of weather boarding is used in this design, but one can hardly suppose the award to have been influenced by that, especially as a medal of merit is given to a frankly "half timber" design. There are no less than twelve competitors for the prize, but a large proportion of them do not seem to have been very serious in their efforts. "Emce" and "Thistle" have, however, produced work of exceptional merit, and "By Lamplight," "Slavekircke" and "Doan Tu Nomi" fair ones. "By Lamplight," Mr. W. Stanley Bates, gains a medal of merit.

There is a great falling off this year in the drawings submitted for the Owen Jones studentship, which has not been awarded. It was stipulated that the Arab Hall in Lord Leighton's house should form one of the subjects for study, and one competitor has confined himself to this one subject. He shows considerable feeling for colour, but his drawing is very poor. The only other competitor has submitted a great many neatly drawn and coloured but lifeless studies.

The Silver Medal for measured drawings is generally well competed for, though the work must be laborious, and not very interesting. This year there are six competitors, and the medal has been awarded to Mr. Thomas Tyrwhitt for a very complete series of drawings of that most charming of Cambridge Colleges—Clare. Mr. Tyrwhitt presents his subject in clean and workmanlike drawings executed with a clear ink line, and with none of the once fashionable tricks of execution. A medal of merit is awarded to Mr. Cyril Wontner Smith for some likewise very neat and practical drawings of Thaxted Church, Essex. Other competitors have found subjects in the Cloisters of Norwich Cathedral, which make rather monotonous elevations; the well-known Church at Cliffe—which is not well drawn; the Old Charterhouse and Queen's College, Cambridge, both of which we may hope to see again in future years, for they are worthy of being studied. Prior Crauden's Chapel, Ely, which is added to the drawings of Queen's, has been more worthily presented on other occasions.

Of four competitors for the Pugin Studentship, Mr. De Gruchy has worthily won his success, though had Mr. Fulton done more and more varied work, he might have had a harder fight for his spurs. His work is, perhaps, almost over-clean and careful, his perspective almost too flawless; one feels it is magnificent, but a little inhuman, and not so sympathetic as if the author had been able occasionally to let his subject run away with him. A medal of merit is given to Mr. Benjamin Bower for some beautiful and telling pencil drawings; and Mr. Fulton gets the Aldwinckle Studentship for some admirable ones of the well-known stalls at King's College, Aberdeen.

In the Institute Council Chamber are exhibited the drawings and sketches made by last year's travelling students, and one set made by the Pugin Student of 1896, Mr. C. C. Brewer, which, if less numerous and less cleanly got up than some of the others. are certainly the most artistically interesting. It is doubtful, perhaps, if the absence of title in two or three instances adds to the interest; one likes to know what sketches represent; but it cannot prevent their being in every sense strong work. Mr. Inglis's drawings are excellent, but their scale is too small as a rule to allow of justice being done to the fine and mostly well-known subjects he has chosen. Mr. Haywood has wisely spent much time on measured drawings; his work, too, is irreproachable, but we could wish he had not wasted an effort upon the drawing-room chimney-piece of South Wraxall Manor. Mr. Henderson, the Owen Jones student, seems to have spent his time in Stamboul, drawing tiles and faience. It is a pity we do not know the secret of burning the fine red he found in almost all cases. The Aldwinckle student has, as usual, been to Spain, but his sketches, though numerous, do not satisfy one that the award to him of the studentship was altogether judicious.

The old Council Chamber is taken up by an exhibition of the "testimonies of study" submitted by candidates in the Institute examinations—drawings that are meritorious, in some cases exceedingly so, but not of sufficient general interest to call for remark.

THE ARCHITECTURAL ASSOCIATION.

COMPOSITION IN PUBLIC BUILDINGS.

AN ordinary fortnightly meeting of this Association was held in the meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, on Friday last week, the President, Mr. Hampden W. Pratt, occupying the chair.

The minutes of the last meeting having been read and confirmed, Mr. T. G. Chambers was elected a member of the Association.

The Chairman announced that on the 28th inst. the Elementary Water Colour Class would commence; and on the 31st Mr. Max Clarke's lectures on "Ventilation, Lighting, and Heating" (Division II.) would begin. The Quantity Surveying Class had been postponed for the present, but it would be started again if sufficient members joined.

Mr. F. T. Baggallay then read the following paper, entitled "Composition in Public Buildings":—

"This subject, which six months ago I rashly undertook to write upon, is a vast one; embracing really no less than the whole field of architectural design; and, although I shall confine myself to its æsthetic side, it will not be possible to do more than deal very superficially with a few points even of that. It is, too, as elusive and slippery as an eel; no sooner does one begin to feel a more or less firm grip upon some part of its complicated anatomy than doubts arise, and the chase has to be begun again. It perpetually leads to the quicksands and dry deserts of philosophic inquiry into the function of art and foundations of beauty, where one meets the mirage of a logical reason for doing what one wants to do; and it leaves one at last floundering in the ocean of uncertainty that surrounds the firm ground of knowledge.

The hydra heads of this provoking subject are the principles that should govern the composing of the various parts of a building into a pleasing and harmonious whole. And though it might be taking things more in order to try to seize its tail first, and discuss the building up of a moulding or a single curve, the incidents of the chase may possibly be a little less wearisome if I attempt to grasp the heads.

The composition of the completed building is really the true function of the architect. In a properly organised system the details and ornamentation would be left to the various trained craftsmen who could, and would, be trusted to work in harmony with their chief and with each other. But ours is a disorganised system, under which no harmony can be attained unless the architect himself composes or, as we say, designs the details also, or has them efficiently copied from others which he can choose. The latter alternative has come to be universally condemned; and properly so. But the condemnation has been so noisy, and the attention it has attracted has been so great, that detail still continues to hold the absurdly prominent position it attained when all architecture was judged by the correctness with which the details were copied. In connexion with any other matter, the admission that anything is a detail is sufficient to relegate it to at least the second place in our consideration; but in connexion with architecture it is often the only thing that is even noticed by the critic. Our only historian, because from the Renaissance up to his time architects generally borrowed a number of ornamental features and most of their detail from ancient buildings, proceeds to heap contempt upon all modern architecture as mere copyism, and goes so far as to tell us that true architecture "expired" at the Renaissance. Most critics, in fact, have for centuries awarded praise or blame to architectural works on the merits or demerits of their ornamental details alone, at one time praising "correctness," and more recently, originality. Few and scarce have been the writers who gave a thought to such things as light and shade, grouping, proportion, scale, character, and expression—except so far as the ornamental features were affected—who were able to lay aside the microscope and the dissecting knife and study the lines and pose of the model.

The fact is, those critics of architecture who have succeeded in being heard have too often been men of literary and general, instead of

architectural, culture, men to whom the ornamental part was the more obvious, and more easily understood. On the ornamental details their attention has been naturally fixed, and to such an extent that, for a time, they persuaded even architects that architecture was a matter of columns and cornices, or of window tracery and mouldings, or of something vague to be invented to take the place of these things. Mr. Fergusson himself was in no sense an architect, though a picture gallery is said to have been erected from his design, and he looked at architecture from the outside only, and, with all his careful comparison of photographs and book illustrations, never seems to have succeeded in seeing anything but a number of different systems of ornamentation which he could number and ticket and criticise for the astonishment of the public, and the confusion of students. It is said that originally his æsthetic sensibilities were not deficient; but if that is so, he had certainly succeeded before he wrote his history of modern architecture in choking them with philosophy and burying them under a mountain of statistics.

Yet even Mr. Fergusson might have avoided, if he had not been blinded by a complication of preconceived opinion and far-fetched theories, the gigantic mistake upon which he founded his indictment of modern architecture, the mistake of supposing that decorative features first began at the Renaissance to be imitated from older buildings. Had it been true, it would have been no proper foundation for a sweeping condemnation of modern architecture. But it is not true; it is so far from true that in every age there has been far more imitation than original design in architectural ornaments; so much imitation, in fact, that, in most cases, "copying" would be the better word. The Egyptians, when they wanted columns and capitals and cornices for their temples, did not invent them, but copied in limestone and granite the bundles of reeds and the accidental forms of their earlier mud structures, and continued to copy them with but slight modifications to the end. The Doric temples were absurdly exact copies in marble of the more ancient wooden ones, even to the nail heads. The details of the Ionic order were borrowed from Asia Minor, and some say the Corinthian also. The Hellenic Greeks, beyond adding a degree of finish due to their greater mechanical skill, never got very far from their originals. The Romans borrowed Greek details by the bunch, and in most cases without any alteration (except that they struck their curves instead of drawing them by hand), and applied them in their own way to their own uses, precisely as the Renaissance architects afterwards applied Roman details; and the Romanesque was but Roman work badly copied. The variations that were developed in the details of the Pointed styles of Western Europe in the three or four centuries through which they lasted were, it is true, considerable; but even they were developed very gradually, and under exceptional circumstances, that are not likely to prevail more than once in a thousand years or more. It is very doubtful, too, if the successive changes were made consciously; it is just as likely that the men who first made them thought they were working the same forms their fathers wrought before them.

Imitation—or, if you will, "copying"—is inevitable as regards architectural forms; and, moreover, it is the only road to improvement. It is not in the power of the greatest genius that ever lived to invent any great number of entirely original ones that will at the same time be acceptable. Those who have been least unsuccessful in the attempt have only succeeded in being absurd, while of the rest the less said the better. New forms must grow gradually, and will inevitably do so if we do not persist in harking back, or in trying to make fresh starts; and if we are not too vain to imitate where we cannot improve, nor too lazy to improve if we can. We need not copy, like the Chinaman who made a dozen cracked slates to a cracked sample; but we shall never get on at all, if each man tries to invent a brand-new style of his own. On the other hand, neither shall we get on if we condemn a fresh variation, merely because it clashes with our preconceived notions. What we must ask is—is the change an improvement, or is its freshness its only justification?—freshness is always delightful—and if so, is the justification sufficient, or has something more important been lost in the shape of actual beauty or significance? In this matter a distinction may be drawn between details that are purely ornamental additions to the general composition, with which fancy can safety sport freely, and those which have a functional character, either constructive or as emphasising any line or form in the composition; any change in these seems to demand some greater justification than its novelty. After all, the time and energy expended by architects in trying to freshen up the elements which go to make up their compositions, seems as if it might be rather thrown away when we think that painters and sculptors have to use the same elements that their predecessors have been welding into works of art since the beginning of time. Architecture, of course, is an art on a very different basis to painting and sculpture; but there seems no adequate reason why the architect should not regard his building very much as the sculptor regards his group—as something to be moulded into a thing of beauty as a whole, though the elements may be as hackneyed as a quotation from Shakespeare.

Should any one ask, ironically or otherwise, how this heterodox theory is to be carried into practice, it must be confessed that the best answer is very unlikely to be satisfactory. The only consolation is that if a painter or sculptor were asked a similar question with reference to his art, the reply would be no better. If these things could be done by rule, there would be no art in doing them, and they would cease to interest any one. The world has long ago agreed that most of the skill to do them well must be born in a man, and that very little of it can be put into him by his own efforts, and still less by the precepts of others; and the world is, no doubt, right. The most that can be done is to call attention to certain matters that seem to have led to success in particular instances, and therefore, presumably, may do so again.

But first it may be well to note what is the character of the elements at the architect's disposal, as compared with other artists. While the painter has the whole scale of colours to draw upon, and every line in nature or in art; the sculptor, all natural forms; and the musician, all conceivable sounds; the architect's choice in each direction is limited. Sound he cannot use at all; his colours must be confined to such as time, exposure, and use will not seriously change, and, externally at least, must be mainly those of his building materials; and his forms must be such simple ones as economic conditions impose upon him as a builder. He has, however, the immense compensating advantage that he can use, not only both form and colour as elements in his composition, but also the finished productions of his colleagues, the painter and the sculptor. It is also noteworthy that, although he cannot create interest by making his building tell a story or represent a familiar scene, he has no need to do so, since his creations have a definite purpose, and therefore an innate interest of their own which he can bring out and possibly emphasise.

One of the first things to remember, and, considering the many temptations to forget it, perhaps the most important, however elementary, is that a building is not a flat thing, but an object of three dimensions, having depth as well as breadth and height; and that the best results cannot be obtained unless this is made obvious to the spectator. A comparison of the Church of the Saluté at Venice with the Grimani Palace, or of Visconti's buildings of the Louvre with the Palace of Versailles, or of the Horse Guards' building with Inigo Jones's Banqueting House, may indicate my meaning. All these buildings are supposed to be excellent works of art, although they come under Mr. Fergusson's description of "modern" architecture; but while the church in Venice, the Louvre in Paris, and the Horse Guards in London, look like complete buildings, the others, so far as appearances go, might be only ornamental walls. Two, the Saluté and the Horse Guards, seem to me unsurpassed as examples of architectural modelling; and it is worth noticing that Kent's success in this was obtained in spite of the always discouraging difficulty of having, not a single large chamber, but a number of small rooms to deal with. Mr. Fergusson, of course, affects to despise the building, being apparently offended by its small scale. One cannot but remark also that the Louvre owes nothing to its details, which are, in fact, distressingly dreadful; but, like the other two, it shows its depth. It does so by means of the projecting arcade, and also, and more especially, by the roofs of the pavilions. We all know that the French generally show the roofs of their public buildings, where we should probably keep them low and hide them with parapets, and there can be little doubt that it is one of the main secrets of their comparative success with such works; at any rate, the details can often have nothing to do with the matter; in many cases they are of the weakest and most contemptible description.

The exhibition of the depth, or third dimension, by merely exposing the return wall is useless; the two walls still appear to be merely walls, as may be seen by referring to the Banqueting House and Sir Gilbert Scott's government offices. I mean no disrespect to the architects of these buildings, for their present appearance is no fault of the great men who designed them, since they are both unfinished. What is wanted to suggest solidity is something showing over and beyond the walls; in the Saluté it is the dome, in the Louvre the pavilion roofs, and in the Horse Guards the charming little turret that Fergusson sneers at. Most mediæval churches and public buildings—Continental ones, at any rate—depend mostly on their big roofs for the purpose, which they fulfil in a simple, natural, and adequate manner; and most modern French buildings, and a few English ones, follow their lead. But in England, even in mediæval times, notwithstanding there were the roofs, we liked to have also some solid structure rising from the middle of the composition and advertising the solidity of the edifice by its substantial appearance. And we have continued to prefer the expedient, where we have adopted any at all, to an exhibition of the roof, possibly from an undeveloped feeling that all roofs look unsubstantial. That it is the grander method there can be no doubt, and St. Paul's Cathedral, St. Albans Abbey, and the Brussels Law Courts testify that it is equally efficient. The Horse Guards might also be quoted, since the roofs of the centre block are practically hidden by the parapets. In this instance, however, solidity is partly obtained by another expedient, more common because more easily applicable in many cases, namely, by pavilions rising a story higher than the rest, and so showing their depth, but it is the turret that pulls the whole together and makes one mass of it.

In these days, large public buildings generally take the form of ranges of apartments surrounding one or more courtyards, and, so far as the periphery of actual building is concerned, solidity is sometimes, though not often, given by the higher pavilions just referred to. But it is now rare to find in England any attempt made to bring the whole together into one by a great feature rising behind the external range. Abroad it has been done in the Palais de Justice at Brussels, the new Parliament House in Berlin, and in many other cases. It might easily be done in our own Government offices by building upon the intersection of the internal blocks; and in a vast number of cases it might be done simply by placing the eternally recurring tower, that we put in the middle of our main front or stick on to a corner, within the courtyard, or at any rate well back from the outside walls. Of course, the tower, as a tower, would lose; at any rate, its aggressiveness would be suppressed; but that is just what is often wanted for the sake of the modelling and unity of the composition. To illustrate this point, I have ventured to cut up an illustration of a very fine competition design published some years ago, to show the effect of taking the tower from the position in which it was placed, and in which there were, no doubt, excellent reasons for placing it, and putting it behind the buildings.

Wherever the tower or other dominating feature of the composition is placed, its proportions, as seen from different points of view, might well receive more careful consideration than they often seem to get. If a tower is used, the main idea seems usually merely to run it up to an enormous height and give it, as nearly as possible, the proportions of a factory chimney. There is frequently the same tendency to excessive height in the drum of a dome, while the flat square domes or roofs used in France and Germany are generally too low. Both the mass and proportions of the main feature, whatever it is, should be regulated by those of the group to which it belongs, a low straggling building wants a high and narrow tower; a more concentrated composition, something broader and lower in proportion. If the area or plan of the feature has to be

small for the edifice, it must be carried up high, or it will appear mean ; if the opposite is the case, it can only be subordinated to the whole by keeping it low ; if it is made lofty it overwhelms the rest, which must then be itself treated as subordinate ; such compositions as the church at the Saluté, before referred to, and the dome over the tomb of Napoleon are examples of the last arrangement, which is obviously the grandest when it can be adopted.

To return to the question of the position of such a feature as a tower, balance requires that it should be somewhere near the centre of the composition. It is inevitably, and is meant to be, the chief object that attracts the eye, and if it is anywhere near the outside, still worse if it is at a corner, the group must be ill-balanced from most points of view. I remember Mr. Armitage, in his Royal Academy lectures on painting, pointing out that the main object of interest should never be near the margin of a picture unless the object were to suggest motion, as in the case of a ship just coming into view, and then the balance of the composition must be sacrificed. In architecture we can never want to suggest motion and cannot have that excuse. It is doubtful if the position should be the exact centre. The best painters and sculptors, though generally careful to put the chief point of interest near the middle of the composition and to preserve a general balance between the opposite sides, always avoid the formality of a strict symmetry. There is something, however, to be said for the view that architects may properly do otherwise, especially in public works ; and that such buildings should be symmetrically designed, at any rate with reference to one main axis, the principal feature being upon that axis and not far from the centre of it. For one thing the formality which other artists avoid is really necessary to give that air of dignity and distinction to a great building which its character demands. It indicates organisation and order and balanced construction. If we pass in review a few of those works which, by common consent are the greatest productions of our art, we find that it is easy to note and appreciate the simple majesty of the Parthenon, the spaciousness of the Pantheon, the soaring vastness of Sta. Sophia, the richness of St. Mark's, the airy splendours of the great Gothic cathedrals and the exquisite lines of St. Paul's ; but we cannot find any general arrangement common to all of them, except their symmetry with reference to a main axis, and are forced to the conclusion that, though many varying systems may be productive of the grandest results in skilful hands, yet symmetry is necessary to all of them. On the other hand, it is noticeable that very few buildings of the first order are symmetrical with reference to more than the one axis, and that there is a certain tameness when it goes beyond that ; carried to excess, symmetry may easily take all the life and vigour out of a composition.

For the sake of unity and concentration the main tower or other principal feature should be single, and not duplicated or further multiplied. If it is necessary to have more than one tower, for instance, or even broken-up roofs, still, some one thing should be large enough, and more especially high enough, to dominate the rest ; and in such cases it is more than ever necessary to put it well in the middle.

So much was said about the angles and end features of buildings in a paper that I had the honour of reading to the Architectural Association some years ago, that it would be but repetition to dwell much on that part of the subject now. When seen in perspective, the angles of a building are as much the ends of the group as they are in elevation (though not the same angles), and some feature, or at any rate different treatment, is necessary there to mark the definite termination and completion of the composition ; without something of the kind a reason for stopping at that particular point seems to be wanting. In any extensive building, rectangular in plan, the sides of which recede from the spectator when seen in perspective, giving long lines running away down towards the horizon, something more than a mere angle-pier or quoins will generally be wanted at the ends of the composition, or a little within them to break such lines and, as it were, lift them up. It is better for the general contour of the group if such features are not at, but within, the actual ends. They may even be the middle features of short fronts. The great thing is that they must break the lines ; they must rise above the skyline and their vertical lines ought to be higher than the cornice or finish of the walls generally, although the cornice may, and indeed should, as a rule, break round them. The necessity for carrying up the vertical lines of these features is often overlooked with unfortunate results, as in the case of the buildings of the Louvre before referred to. Great care should, however, be taken that these secondary features do not compete with the main central one for attention. They should be smaller in every way, but especially they should be lower ; and to get the best result they should be entirely different in design. The hen and chickens arrangement of a great dome and several little domes, or a great tower or spire and smaller echoes of it, is always less satisfactory than a group in which there is no suspicion of an attempt on the part of the secondary features to ape the principal one. There should also be a very restricted limit to the number of these secondary features ; or, at any rate, neither the same design nor even the same general outline and proportions must be repeated too often ; and never repeated in features which occupy different situations in the composition. Such repetition leads to both redundancy and the most poverty-stricken kind of monotony.

In buildings like the Gothic cathedrals, in which the horizontal lines radiate from the centre, and consequently, when seen in perspective, run up instead of down, I do not think that any secondary features to break them are required. A little turret or group of buttresses to stop the composition seems sufficient. It may appear a rather daring thing to say, but the western towers of cathedrals in most cases seem to me a mistake. They are generally far too large in scale, and too similar in form to the main central tower, to group well with it ; and they are at one extremity of the composition in most views, balancing, if one can call it balancing, nothing at the other end ; which indeed, where there is an apse, is sloping downwards in a very undignified way. The Romanesque architects, in this respect, managed better, generally getting towers or turrets at both ends. Perhaps, where there is an unusually long nave, something smaller than towers, not placed at the extreme end, but a little way from it—say, another transept—would have been an advantage ; but Salisbury has not anything, and, even apart from its size, it is a far more pleasing composition than Lichfield, with its three spires. Western towers, with nothing large enough over the crossing to hold its own is a gigantic mistake, of which Cologne Cathedral is the typical example.

The breaking up of sky-lines is a thing that has often been recommended ; but while it is, as before remarked, generally necessary to break a long one upwards or stop it at the end, to break it by a drop or cut through it is a thing to be avoided at almost any cost, and to do so for choice is to make a very serious mistake. It is still worse to break through a main cornice. These lines are perhaps the most important in a composition. They are wanted to hold it together, and give it unity and strength, and to cut through them is like cutting the cords of a bundle of sticks, and allowing it to fall to pieces. The fine art museum at Lille has this fault in an astonishing degree for a building that is admirably designed in almost every other respect, and detailed with a skill that few of us could equal. It really looks as if it wanted a chain or cable round the top to prevent its falling apart.

After solidity and unity, one of the most important things to be seen to is character ; and one of the chief elements in character is scale. Small parts tend to delicacy and prettiness, large ones to strength and grandeur. Small parts are supposed to make a building look large, and large parts to make it look small ; but the influence of scale in that respect is probably greatly overrated ; a man near, or any object the size of which is familiar, trees and surrounding buildings, and so on, give to the eye a just impression of scale which no exaggeration, in either direction, of the details of the building itself can do very much to remove. The attempt to give an impression of size by this means is supposed to be not only legitimate, but praiseworthy. But it is after all a species of deception, and one which really defeats its own ends ; for there can be no object in trying to exaggerate the size of a building unless it be to produce an impression of grandeur ; but small details necessarily suggest delicacy and thinness, qualities absolutely opposed to grandeur. If the smallness be more than is reasonable, or rather, more than is customary, the structure even begins to look like the model of a larger one. It is of course possible to go too far, and to make details so large that they become coarse and vulgar. But for a public building, or any great architectural work, it is essential to its character that the parts shall be large enough to look exceptionally substantial, to suggest big piers, thick walls, a general massiveness, and, above all, largeness of idea and an avoidance of pettiness. Substantial construction may be suggested without the use of ornamental details by setting the door and window frames back and showing deep reveals, by the use of large material, by plenty of unbroken wall, and in other ways ; but the simplest treatment calls for a little detail of some sort, the scale of which will help to give character and in public buildings should be large. Particularly the projection or relief should be adequate, since it is that which most suggests the existence of plenty of thickness. Thus attached columns, besides being more delicately shaded, and therefore more beautiful, are also a far finer treatment than pilasters. Unfortunately, they are also more expensive and more difficult to deal with, but that is by the way.

Whatever the scale is, it is most important to use it consistently. One used to be told that you must not have two scales side by side, but that is a mistake ; there is no harm in having a nave arcade of large arches and a wall or screen arcade of small ones, nor in using a large order on the walls and a small one for window dressings. What is inexcusable and destructive of harmony is to put a cornice, consisting of a number of small mouldings, on the top of a pier, the cap of which is composed of a few large ones, or to give the nave and screen arcades the same sized mouldings, or, to take a commoner case, put to the same building a block cornice composed of small mouldings and a plinth of one big one. This is a matter which is not unfrequently overlooked in the sculpture and carved ornaments of a building, even when there is no fault to find with the architectural details. One sees light, delicate carving in low relief lost under large, heavy pediments and cornices, and, on the other hand, great coarse figures supporting or sprawling over mouldings which seem by contrast mere threads.

Sculpture, and what is called architectural carving, are generally used to emphasise certain points, or, as it were, to punctuate the composition ; and to a certain extent also to cover up awkward lines or spaces, which, by management of their own lines, they can be made to correct or obliterate. But although these uses are legitimate enough, it is most effective in broad masses such as deep bands and friezes, and particularly, strange as it may seem, in the half lights under cornices, pediments, and the like ; perhaps because it breaks up and gives richness to the shadows.

Attempts to deal definitely with the light and shade on the exterior of a building meet with little encouragement from the weather in our climate, where, during so much of the time, it is difficult to see the difference between the two unless the shadow is a very black one : and an architect who depended on them alone would only get his effects for a few hours occasionally. It is, however, a very important subject, and always worth considering. The broader lights and shadows of the masses and breaks in a composition, of course, change in shape as the earth moves round the sun, and at first sight it seems as if it would be too complicated a matter to try to do anything with them. Such is not, however, altogether the case ; for a consideration of the fine effect produced by a broad shadow might often influence the depth of a break if the designer thought about it ; and if he remembered how beautifully a round surface curves and softens the edges of a shadow cast upon it, he might sometimes be influenced in favour of such a form. It is also true that a lighted surface may be thrown almost entirely into shadow by breaking up the surface, provided the aspect be favourable. But it is in what may be called the incidental shadows that most may be done. Incidental shadows arise from making recesses in lighted surfaces, or in contriving projections from them. The most beautiful of such shadows are generally deep horizontal ones, such as that produced by the little galleries under the eaves of Romanesque buildings, which answers to that under a classic cornice, but is stronger and beautifully enriched by the sparkle of light on

the columns. Neither light nor shade, although they should be in broad masses, want to be in quite flat, unbroken ones. If there are a few windows or holes to give black spots, and a few projections, such as mouldings or balconies, in the lighted surface, and different depths of darkness in the shadow, both are richer and appear stronger. The finest broken shadows are those formed by a covered colonnade with a wall behind, giving delicately graduated shadows on the columns and a deep one on the wall; such a feature also suggests solidity. But in criticising the main façade of the Louvre, Mr. Fergusson finds it vexes him, because he assumes (quite gratuitously) that the back wall does not run down to the ground, and he wants to know what it stands on.

In interiors the management of light is one of the most important means of obtaining good effect. Instead of trying, as we too often do, to merely get an equal flood of light everywhere, that is precisely what we should try to avoid. Enough, people say, is as good as a feast; and doctors tell us it is much better. And so it is with light; enough is one thing, an all pervading glare quite another. I do not advocate dark corners, which are a disgrace to any architect, and only lead to the use of artificial light. There is no credit in doing our work well if we are going to ignore practical conditions. But a contrast of light and shade is as necessary inside as outside, and in this country we can do far more with it inside. A corridor equally lighted throughout its length is perfectly uninteresting, though the light be from the side or the top; but one which is crossed by a broad patch of light that increases the obscurity of the comparative shadow beyond is interesting at once. A definite light from one side, or from above, casts shadows and gives form to objects, whereas an equal light all round casts no shadow, and destroys form and distance. The worst light is one directly in the spectator's eye; not only is it physically annoying, but it shows everything in equal shadow. The best light is often said to be a top light which throws all the upper part of the apartment into shade and lights the floor and lower part of the walls. But light high up in the walls which lights the ceiling and leaves the lower parts in comparative shadow is even better. The now common practice of putting electric lights close up to a modelled ceiling, throwing a grey shadow over the ceiling but bathing everything else in a flood of light, is really a terrible arrangement.

In internal effects generally we are at the the present time, in our public buildings, immeasurably behind the architects of other ages, and even of our contemporaries in other countries. Any attempt, for instance, at a really fine staircase such as is usual in the public buildings of France or Germany, or at a spacious hall, almost always frightens people if it is made. And it is seldom made because ninety-nine out of a hundred of our public buildings are the result of competitions in which architects are asked for an amount of accommodation which can only just be provided, if it can be provided at all, for the cost; and although it is sometimes stated that corridors and staircases are to be ample, every one knows that what would be considered the minimum in France would be regarded as sinful waste in England.

Decorative painting and sculpture are in much the same case. A proposal to employ an artist of eminence for such work, as is always done abroad, generally causes an architect, in this country, to be looked upon as a candidate for Earlswood. If he names an adequate amount as the cost of getting such work properly done he is often told that he does not know his business; that the local decorator or carver only charges so and so; and unless he is a very strong man, or a very subtle one, all his labour in composing his building will be often lost at the last moment by its being spoilt with vulgar ornament, to gratify the parsimonious instincts of a public body which, unfortunately, can quote the government of the country as an example.

I have only been able to touch on a few prominent points of my subject. It would be as easy to measure the universe with a two-foot rule as to put the art of architectural composition into a few pages of foolscap. Such matters as emphasising vertical or horizontal lines, or emphasising or suppressing both, to give expression or character to a composition, the subject of proportions generally, and many other things will, I hope, be touched on by others."

Mr. J. M. Brydon, in proposing a vote of thanks to the lecturer for his paper, said it was one of those subjects which ought to interest all architects, and especially young architects. Composition was one of the subjects which lay at the root of all architecture, and for some reason or other it was the subject which had the least attention devoted to it at the present time. Mr. Baggallay had touched on the main points which helped to make composition in architecture, and which assisted in making a building great or small, irrespective of size; but he had not brought forward some points quite as prominently as might have been expected — for instance, the influence of material on composition. Material had always had an immense influence on the form which a building took, and naturally on the features, which helped to make up the composition. The nobler the material, the nobler the composition, and, possibly, the higher as a work of art the building would be. In all stones, especially marble, for instance, the nobility of the material was evident, from the largeness of its parts, or the colour that could be got from it, and in such a way a great effect could be got by simple means—far greater than with a material of less nobility, such as brick, or that latter-day abomination, terra-cotta. Probably nearly all the great temples were developed from wooden construction, but immediately the era of woodwork gave place to stone, the whole construction became a stone construction, and hence the great power and majesty of such a building as the Parthenon. In our public buildings, if we wanted to get great majesty and dignity, we must go back to the original grand building materials, viz., stone or marble. To attempt to produce a great building in a small or less noble material would be more or less of a failure, that view having been emphasised by several public buildings, which had been erected in modern times, especially where terra-cotta had been used. He thought it was nearly impossible to get a great building with a material which was not constructive, but decorative like terra-cotta. As an example, he might quote the Science School at South Kensington, where terra-cotta was legitimately used. They there got over the difficulty in a more satisfactory way than when a building was constructively thought out in terra-cotta. In the great hospital at Milan there was some beautiful terra-cotta work used in a decorative sense. Another important point with regard to composition was the site which the building had to occupy, and a notable instance of a building being well adapted to its site was the Palace of Justice at Brussels. The church of the Saluté, at Venice, was also admirably adapted to its site, and as one approached it from the water the reflection in the water seemed to be broken up by the ripple of the water. Nothing could be finer on the low site. With all deference to Mr. Baggallay's opinions, it was not the composition but the height of the tower which was wrong in the design which had been exhibited. He was therefore inclined to differ from the lecturer, and he thought that it added to the dignity of a tower to see its lines, or some of them, go down to the ground. A successful instance of a tower not being carried down to the ground could be seen at the Glasgow Town Hall, where at various distances the tower, which rose from the courtyard, could be seen rising over the building; but even there one felt a desire to see the tower go down to the ground, as did the wonderful towers of Wren's churches. Too much attention was given to picturesqueness in these days, as well as to what was called detail. Unless a building had good proportion, dignity of parts, and unity, no amount of picturesqueness and detail would ever redeem it from utter commonplace. The first principle should be that the body must be right before the members could be, and that principle was at the bottom of all composition in architecture. The lecturer was right in saying there must be some dominant feature in the composition, and that towers, for instance, must not all be alike. Another little weakness which was allied to this so-called striving after picturesqueness was the want of reticence, or simplicity, want of restraint—the attempt to put "all the goods in the shop window." To young architects he would say, "There is no hurry; when you have a building to carry out don't think it is the last and only one you will ever erect; and don't crowd all you know into your design." Such things were usually done by young men, but time cured all that, and they would learn that all such efforts were thrown away. What permanently remained were the broad simple masses, and the grandeur of outline which was only to be obtained by an earnest study of the principles of composition. Remember that Inigo Jones, one of the greatest architects we ever had in England, and a master of proportion, had a contempt for what was mere prettiness of detail. One of the finest works in composition was Greenwich Hospital, which Jones commenced and Wren completed. That was an example of building in a noble material on a wonderful site. It was the fashion nowadays to treat style with contempt, and if an architect designed in a particular style he was looked upon as old-fashioned, for the idea seemed to be that every one must do something original —just as though style had not developed gradually and could not be produced all at once. In the words of that great master, Inigo Jones, architecture should be solid, proportionate, masculine, and unaffected. When they had it so they had a great composition, but not otherwise.

Mr. H. H. Statham, in seconding the vote of thanks, said that the subject was a fascinating one but, as the lecturer had said, it was so great that one hardly knew on which side to approach it. There were one or two matters in the paper which suggested points for further consideration. He was very glad, for instance, to hear some one in that room run a little tilt against the theory that all architecture was dead at the Renaissance, for he considered that that was a complete mistake. Fergusson and others got hold of half the truth and treated it as if it were the whole. There was no doubt that the theory of architecture completely changed at the Renaissance, but nevertheless, since then there had been a great deal of thoroughly original architecture; although it took some of its detail from antique styles, it did not take its design or composition. It was rather amusing, although it was perhaps not good-natured to say so, to hear Fergusson put through the mangle, though he thought that the time would come sooner or later. Fergusson would not have minded; he had a calm conviction that he was always right, and the lecturer's criticisms would not make him turn in his grave. No doubt there was some truth in Mr. Baggallay's criticisms. They must all have felt that a great deal of the criticism in Fergusson could not be accepted, and there was no doubt that Fergusson allowed himself to be so far led away by the enthusiasm of the moment as to refer to various buildings in town as the greatest or finest in the world. But he thought that Mr. Baggallay had done Fergusson a little injustice, because Fergusson did not give his whole attention to detail. If they went fairly through his works they would see that he grasped the fact that the idea of the plan was the basis of the whole design. Fergusson had in his mind that a building was to be judged by the conception of the plan, and what was put upon it, though, no doubt, he gave a little too much attention to detail. As the lecturer had said, detail was overrated; the real test was the composition. But was not refinement of detail a very good means of judging of a man's refinement of conception, and the attention which he gave to his art? Mr. Baggallay had drawn attention to a most important idea, as to showing solidity of a building by raising the interior portion of it. But he (the speaker) was inclined to think that in the case of a tower it was better to see the lines carried down to the ground; the whole composition was improved by putting the tower in the centre, but the tower itself was not improved. Then, again, there were occasions when a building was placed at an angle or junction of two streets where the angle became a very prominent part of it, seen down two principal thoroughfares; and it was quite right to accentuate the building by putting the tower at such an angle: it became the keystone, so to speak, of the whole building. The whole question depended very much upon the site. In regard to the treatment of roofs in composition, the lecturer had exhibited an illustration of a French Mairie (Neuilly) which showed how not to do it. The central roof, instead of being carried on to the end pavilions, was designed so as to leave a gap between them, with very bad effect. He did not care for the detail, and yet he wished that such sculpture could be seen on English buildings

as there was on the Neuilly Town Hall. The great inferiority of many French and German Cathedrals in their want of a central feature arose, of course, from the ambition of the builders. They wanted to carry their building to a great height, but they dared not, for structural reasons, put any large feature on the central piers. In regard to upright features, the lecturer seemed to think that it was almost always better to carry the cornice round them. That depended upon circumstances. There was a most clever and original building in Edinburgh, the McEwan Hall, where there was a set of buttresses, large, solid, stone projections, round which every string and cornice were carried. He thought that if the buttresses had been left to go up as masses of masonry and the string courses had been allowed to butt against them, the effect would have been more powerful. He quite agreed as to the importance of a fine staircase and the difficulty of obtaining this in England where it was considered a waste of space. He agreed also with what the lecturer had said about too much attention being paid to picturesqueness. He was afraid that there was rather a tendency in these days of competitions to endeavour to catch the eye by picturesque perspectives, instead of by a logical and well-worked out plan. That was one of the evils of competition, which had its disadvantages as well as its advantages. With regard to a design for the Imperial Institute, to which the lecturer had referred, though it was a very fine-looking design, it was rather an example of composition being too independent of the plan. In order to get the fine effect of the circular sweep a great deal of space was left on either side of the building, of no particular shape, and of which no use could have been made. Unless the sweep arose out of the plan, it was a thing to be avoided. In regard to the German Parliament Houses, something more might have been said in the paper than that the dominant feature was kept too low, viz., in regard to its ugly outline and its want of monumental character. He thought that was the worst central feature of any large public building of importance that he knew of. In a central feature of that kind, if they chose to keep it low, they should make it a monumental instead of a glass and iron structure, which lowered the whole effect of the building.

Mr. A. T. Bolton said that with regard to the German Parliament Houses, he remembered seeing it stated in a foreign paper, at the time the building was opened, that the committee, and not the architect, was responsible for the central feature, which was lowered materially from the original design. The result was very unsatisfactory, as, he believed, the building was in other respects—though it was satisfactory to know that the architect was not responsible for that central feature. Whatever they might say about architecture, was apt to resolve itself into a personal opinion. With regard to the position of towers, he did not think that the towers of the Houses of Parliament, as they were placed, were a mistake, though no doubt Mr. Baggallay would answer that another feature, the central tower, first suggested by the ventilation scheme, had been introduced, and so balanced the composition. In regard to the illustration with the movable tower, which Mr. Baggallay had exhibited, one point about it was that, if it were put in the position suggested by Mr. Baggallay, it would have to be a great deal higher, because, directly such a feature was put behind the main walls, it had to be made very high to get it to stand out at all. The Brussels Law Courts, seen from the outside, was a very fine composition, because this necessity had been borne in mind; but the effect inside was terrible: it was like looking up into a well. With regard to French cathedrals and churches, the French Romanesque churches had nearly always a central tower, just as the Norman buildings in England had. But later the French realised what an effect they could obtain by great internal height which rendered impracticable a massive central feature. He thought a Frenchman would be horrified by the remarks which had been made as to the detail of modern French buildings, and, after all, was it not a question of education? The detail of French buildings was, if they granted the premises, about as fine as it could be. The whole ideal of the French, which was very arbitrary, was that there were certain models left by the Greeks or Romans, and the thing was to apply them. A French student did not study old works in general as an Englishman did. A Frenchman looked at everything with the eyes of the Ecole des Beaux-Arts, and if we took a building like the Ecole de Médécine, we could hardly have any detail better suited to its design. A good deal of the speciality of French detail arose from the peculiarity of the stone used, and the custom of working it in position. He did not think a great central feature was always needed, and some fine buildings could be mentioned with purely horizontal lines, such as the Pitti Palace. The idea of not showing the roof of a building was Wren's, who thought that there was no roof worth showing, except the spherical. He thought that Mr. Brydon had been very severe in his remarks on brick. In his, the speaker's, opinion brick did not always have a fair chance, but as it was, sometimes exceedingly dignified buildings were put up in brick. He might mention the Spanish palaces at Saragossa, for instance, and certain old Roman walls, which had a grand effect. The reason why the use of brick was not generally more successful was that we used it often with stone detail. Every brick had a moulding on it, so to speak, and each brick got a certain emphasis; but in grand examples of brick architecture the bricks were thrown in like cubes of mosaic, creating large surfaces, the effect of which was very noble The Horse Guards' building was not finished by Kent, and Ripley was responsible for carrying out the central turret, which accounted for its bald treatment. He might mention that Mr. Reginald Blomfield's recent book on the Renaissance contained a good theory and examination of what Renaissance architecture in England amounted to. The plan for the Imperial Institute exhibited was the resurrection of a plan introduced by Inigo Jones at Stoke Park, which was developed by Wynne, Vanburgh, and Leoni, and finally by Barry at Cliefden, where he was working on lines that Wynne and Archer had laid down. They started with the works of Palladio, who built villa-palaces out on the main land for the Venetian nobility. These buildings consisted, not only of a house, but also of farm buildings as wings to the main block, where the basement also was used for storage, &c., the apartments being upon the first floor and reached by a great portico and external staircase. Palladio was enabled to produce some grand conceptions in this way, which delighted every one, including people in England; but the difficulties of carrying out such designs in this country were enormous; the Englishman did not want the farm buildings in conjunction with his house, and he had a fancy for the ground floor for his own use. If they looked through the Vitruvius Brittanicus they would be able to see what efforts were made in this direction, and the difficulties that arose from the abolition of the farm buildings. As Mr. Statham had pointed out, it was hard for the modern architect to know how to utilise the wings and quadrant connexions of such a plan who had not the courage of the architects of Vitruvius Brittanicus to label the vacant space "waste" or "this room to spare."

Mr. A. S. Flower said that what Mr. Bolton had described as the Italian view of planning seemed to be still in favour in Ireland, in preference to the English one. He had been asked some time ago to make some alterations in a house in Ireland. He was told that the kitchen court, stable yard, and farmyard must run together, and that all the domestic arrangements would be upset if any separation were introduced. With regard to the question of position of towers, he was inclined to the views of the lecturer, for he thought a much better effect could be obtained if the tower were not carried down to the ground. The effect at Salisbury Cathedral was very good. In most drawings of village churches, where the tower went down to the ground, the effect was certainly improved by putting in foliage, tombstones, &c., leaving the lower portion undefined. A central tower was better, in his opinion, than such a tower as the Victoria, where everything was carried right down to the ground and attention too much concentrated below. He hoped that what Mr. Baggallay said about binding towers together would be borne in mind. The central tower of Lincoln Cathedral was spoilt, in his opinion, because this point had not been attended to. If they looked at the illustrated professional papers, they frequently saw designs for towers which were a mass of buttresses with hardly any cornice at all. In the newer kind of design this idea of doing away with connecting or tying lines seemed to be the fashion, and, like the author of the paper, he thought it was a most perverse one, which he would like to see disappear. However, he might point out that sometimes if the cornice were carried round too consistently at an unvarying level they lost some effect in the building, as might be seen at the Langham Hotel and the new Record Office.

Mr. Banister F. Fletcher said that he thought architectural students should read Burke's essay on the "Sublime and Beautiful," for there were many points connected with beauty in architecture which the author explained quite admirably. According to Burke, beauty was not always a question of masculineness. Though Mr. Brydon's theory in regard to that as applied to public buildings might hold good, in small buildings it would not do at all. As to the lecturer's remarks about the shadow of a great cornice, unfortunately in northern countries we did not get the advantage of the Classic cornice. In such countries vertical lines, as given by buttresses, in English cathedrals, &c., were more valuable. He thought that Mr. Baggallay's paper should lead them to consider why they did not study composition. It was most extraordinary that they did not, seeing that the most valuable part of an architect's education consisted of learning how to compose and design public buildings, and a class for the study of composition could very easily be formed, say, by collecting a number of plates from the architectural journals and treating the designs in some such way as Mr. Baggallay had dealt with the design with the movable tower. If such a class were formed, and the composition were studied of buildings which had been designed, a great deal would be learnt by them in the design of public buildings, which, as far as England was concerned, was left to chance as contrasted with the design of public buildings in other countries, especially France.

The Chairman said that they were indebted to Mr. Baggallay for his thoughtful paper. In regard to the composition of towers and their height Mr. Baggallay would no doubt reply to some of the criticisms that the tower must always be considered in relation to the site. He was sure that Mr. Baggallay would not wish them to take what he had said as matter for their complete guidance. It must be remembered that site was at the base of composition, and this was especially the case in town architecture, rather than with architecture in the open country. In towns they nearly always had something which affected the scale of their buildings. With regard to the influence of material on composition, there was not only the question of material to be considered, but also that of colour in its relation to composition. Whatever they might say in regard to brick, they had it always with them, and they must take it always into consideration. It was a material which was largely used, and it could not be looked upon as a decorative material, and where it was used in connexion with stone, it very naturally affected composition, and might considerably mar the design of a building unless the use of the material were very carefully considered. In regard to the position of towers in church buildings, the lines of a central tower, while they were not actually carried down to the ground, were suggested, for the tower at its junction with the nave was of the same width, and this gave the same effect of stability as though the tower were carried down to the ground. A good deal depended, however, upon the proportion of the tower as to the position it occupied in the composition. With regard to what the lecturer had said as to the repetition of a feature, that, he thought, applied more particularly to towers than to domes. His own impression was that where there were a number of domes the effect was satisfactory, and he would differ from the lecturer if he applied the same rule to domes that he did to towers. Mr. Brydon's remarks in regard to the present-day study of picturesqueness and detail, rather than composition, were particularly welcome. No doubt there was such a tendency prevalent. The feeling existed that in regard to the smaller buildings there was not much chance of composition, and where they had no particular feature to give character to a building they were tempted to favour quaintness and picturesqueness to the exclusion of grander ideas as to composition. In regard to the question of the smallness of detail, he was glad to hear Mr. Baggallay's remarks. In London there were buildings which, in his opinion, were spoilt on account of the detail being so

small. He thought they could have refinement in detail and at the same time have boldness. It was the pettiness of detail which spoilt the scale of the building, and he was inclined to think with Mr. Baggallay that in such a climate and in such a city as ours it was more important to seek proportion in buildings, and breadth of detail, than that we should seek a lot of detail and pettiness in that detail. Of course, the question of detail and decoration largely entered into the subject of composition, but the main points of composition grew out of the plan, which was the first thing to consider in designing a building, and if we were to consider a little more carefully the main points which the lecturer had raised, and particularly the question of depth, the result would be an improvement in our buildings.

The vote of thanks having been put and carried unanimously,

Mr. F.T. Baggallay, in reply, said that he had overlooked the fact that material influenced the general composition of a building through the details, as it were. As Mr. Brydon had pointed out, the beauty and exquisite finish to be got on marble leads to simplicity, while the facility with which ornament in terra-cotta could be employed led to thinking in terra-cotta, and so keeping things small. In regard to towers, he thought he stated in his paper that the tower itself would lose in effect unless carried to the ground. If they wanted a fine tower, no doubt they would have to carry it to the ground, but if they were thinking, not of the tower, but of the whole composition, the tower should be put behind, and in some position where it formed a central feature, rather than at the outside, or at a corner, even at the junction of two streets. He did not quote Greenwich Hospital, because it was one of those exceptions to his rule which required an Inigo Jones and a Wren to make it successful. He did not advise any ordinary architect who wanted a fine building to put up two wings in such a way that people could see right through them. As to the self-contradictory statements contained in Fergusson, he had come across passages where the reason for liking one building was given as the reason for disliking another. Fergusson's book was a most useful one, which gave one many excellent ideas, but he regretted that it was considered such a standard work, as, in his opinion, it was dangerous to young students who did not know how to sift the good from the bad. He wished that somebody would write a work to take its place. Mr. Statham had referred to the refinement of detail being really pleasing apart from the composition of the building, and he (the speaker) understood he said so because an architect could be judged by the refinement with which he dealt with the detail. One of the tendencies of the present day was, he thought, to think too much of the architect. If the only use of refinement of detail were to judge the architect, he would say: Never mind the detail at all. He had, perhaps, exaggerated his contempt for detail, but he thought they would get more refinement if they kept to the old work than if they tried to invent new detail for themselves. Detail might be coarse and bad, and thus spoil a building; but they would not find coarse and bad work in old buildings; they would have to invent it themselves if they wanted it. The roof of the Hotel de Ville, which Mr. Statham had referred to, was an example of breaking up the roof precisely like that of the Art Gallery at Lille, and it had the effect of preventing a building looking like one mass. In regard to carrying cornices round corners he did not say that that should always be done, but as a rule. There were exceptions, and perhaps the one which Mr. Statham had referred to was a case in point. That would be one of the difficulties in regard to the proposed class of design: there would be almost as many exceptions as rules in such a subject, and any one who tried to lecture on it would find pitfalls on every side. It was news to him that the square dome of the Berlin Parliament Houses had an iron and glass roof.

Mr. Statham said he was not absolutely sure about the point, but he had a very strong impression that that was so.*

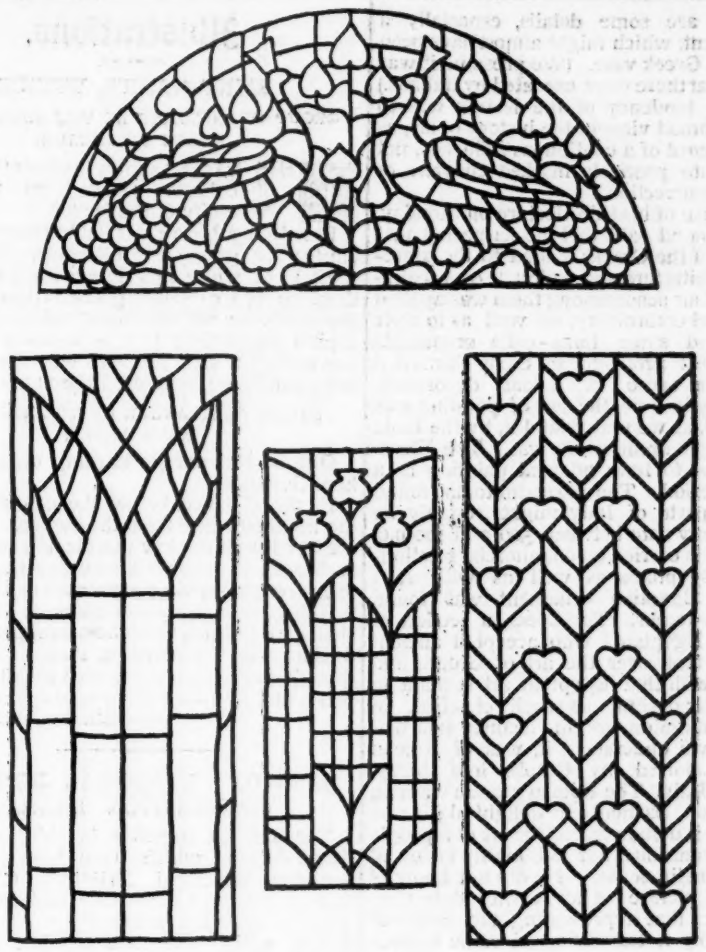
Mr. Bolton expressed the same view, and said that the same thing had been done at the Tate Gallery.

Mr. Baggallay, continuing, said that it seemed hardly credible that such a mistake as that had been made. There seemed to be a general opinion in this country that square domes were ugly features, but he doubted whether they were always ugly features, and he thought they might sometimes be used by English architects. The Houses of Parliament was a fine building, but he did not think it owed its beauty to any grandeur or to its composition: its effect was due chiefly to its richness—to the constant repetition of small detail, just like some of the small Flemish buildings. As regards the two towers of the Houses of Parliament, he thought that as affecting the composition they were wrong, though they were beautiful in themselves. To put one tower at one end and the other at the other was a mistake. As regards bricks, he agreed with Mr. Brydon that they could not have a really great building if they erected it in brick, because of the smallness of the material. Large stones could be used but not large bricks. In regard to Mr. Fletcher's remarks as to the classic cornice not giving in this country so strong a shadow as it did in other countries where there was more sun, he thought that the vertical lines which had been recommended were rather to be avoided, as they had the same effect of pulling a building to pieces as cutting through the cornice had, unless they had some big cornice or some deep shadow to pull it together again.

The Chairman announced that the next meeting would be held on the 4th prox., when Mr. John Belcher would read a paper on "Hampton Court Palace," which would be illustrated by lantern views.

The meeting then terminated.

* The statement was quite correct.—ED.



Designs for Decorative Treatment of Leaded Glass. By Miss E. M. Steadman.

DESIGNS FOR LEADED GLASS.

THE illustrations show some designs for glazing arranged to give interest by means of lead lines, which have been carried out by Miss E. M. Steadman and Miss Rayment, who have started an atelier for the treatment of glazing by this and other methods.

The material used is blown glass, which is considered most suitable for the kind of treatment on account of its quality, clear colour, and varying thickness.

The drawings show the work to about ½ in. scale.

REREDOS, GIRTON CHURCH.—At the church of St. Andrew, at Girton, a reredos has been erected, and other improvements to the chancel have been carried out. The architect was Mr. T. D. Atkinson.

SIR W. RICHMOND'S LECTURES.

THE second of Sir W. Richmond's Royal Academy Lectures, delivered on Thursday of last week, was devoted to the subject of "Greek influence upon Italian Art;" his position being that there was never any entire break in the Greek tradition,* and that it could be traced as an influence from antique times into the full period of the Renaissance, the latter movement being only a "revival" in the sense that it gave renewed impulse to a tradition which had never really died out. A large number of photographs from works of different periods, hung on the walls, served to illustrate this view. Among others was that of the curious façade of the Church of Castel del Monte, with its Italian Gothic door and window within and above a somewhat rude but quite palpable reproduction of a Classic order and pediment with a modillion cornice; for Sir W. Richmond never lectures merely on "Painting" but on "Art," including architecture as of the same importance with sculpture and painting (which is not the way of all R.A. painters). A number of photographs of Pompeian wall paintings were exhibited—the well-known type of dancing figures, with the photographs of two Greek vase-figures placed among them, showing a curious resemblance in style and pose. In Botticelli's well-known "Spring" the Greek influence was clearly traceable; while a Sienese picture in the collection, as well as other works, showed the tradition as conveyed through the channel of Byzantine art. Photographs of stucco ornaments from the via Latina at Rome indicated the origin of the types of Renaissance floral ornament. The mosaics of Ravenna and St. Mark, placed side by side, again illustrated the influence brought through Byzantine art. One of the most striking examples was shown in an illustration from Laffillée's "Peinture Decorative en France" from the eleventh to the sixteenth century, a chromolithograph of the decorations in the Château de Coucy in the thirteenth century,

* Browning hints at this idea in "Sordello," the action of which is laid in the early part of the thirteenth century—

"Witness a Greek or two from the abysm
That stray through Florence-town with studious air,
Calming the chisel of that Pisan pair:
If Nicolo should carve a Christus yet!"

where there are some details, especially a scroll ornament, which might almost have been taken from a Greek vase. (We presume it was considered that these were executed by Italians.) The general tendency of the lecture was to inculcate a broad view of the history of art, as being the record of a continuous influence, not broken up into precisely marked chapters of decay and resurrection.

In the course of his third lecture on Monday, Sir W. Richmond said that he suspected that the religion of the Greeks tended to the precedence of architecture and sculpture over painting. The colour sense among them was applied to textiles and embroidery, as well as to their buildings, and some terra-cotta ornaments found in great profusion in Sicily showed a very delicate sense of colour decoration. Before Homer's time, the art of painting was not practised, as we understand it, by the Ionic Greeks, though architecture was. The Etruscans appeared to have adopted painting at a very early period. The Etruscan tombs found in various parts of Italy might roughly be assigned to any date between 500 and 100 B.C. The Etruscans carried on commercial relations with the Egyptians as well as with Asia Minor, and Egyptian ornament was found on Etruscan tombs. The Copts, a section of the ancient Egyptians who accepted ancient Christianity, took over the art of Greece and Rome, and with that Egyptian art seemed to cease. Coptic design was wholly classical. In speaking of mosaic work, the lecturer said that mosaic, as we understand it, was of Roman origin, transported by Greeks into Sicily, Venice, and Italy. The Roman mosaic was not, in his opinion, particularly delightful; it was interesting; it demonstrated the art of a people who were luxurious, but not highly endowed with the æsthetic sense. He did not know of any mosaic picture of an earlier date than 70 A.D., viz., that representing the Battle of Issus, possibly a translation of some famous wall painting. In design the fragment was extremely fine, and, *quâ* mosaic, it was perfect as an example of technical excellence, although the detail was not as minute as that of later mosaic workers. In the British Museum were several examples of very minute mosaic work. During a period of the Roman occupation of England, mosaic pavements were commonly placed in the homes of the rich folk. The Normans did not introduce into their own country the art of mosaic. Tradition told us that the Norman churches were highly decorated, and they broke up their mouldings with painted ornaments. This habit was not Norman only, for it existed at a tolerably early time in Greek architecture also, and however strange the practice, the result was often very beautiful. The mediæval decorator did the same, and he had been told that the ribs of the vaulting of Westminster Abbey were decorated in this way. In the post-Christian era, mosaic was used almost exclusively for church decoration or church service, and its influence was extraordinary, but was concentrated chiefly in countries exposed to Oriental influence. Speaking of colour in its relation to light and shade, the lecturer said that light and shade had a tendency to overmaster colour, and was wholly out of place in decoration. The ingenuity of colour in light and shade, which was shown both by the miniature painters and the wall painters in Italy, France, and even in England, up to the fifteenth century was a tradition handed down from the Byzantine artists. Mosaic was a very laborious craft even in its simplest form, and was not fitted for very small or refined work; though examples to the contrary could be cited. He did not mean to imply that subjects to be treated in mosaic must be of colossal scale, and that figures of life size were not suitable, for there were instances to the contrary. He desired to warn students who took up the decorative arts as their profession, against attempting to express themselves in a material ill-suited to the scale or motive of what they had to design. Titian, the most complete painter the world had produced, Tintoretto and Veronese, though unrivalled on canvas, were not consummate decoratists, and mosaic was a material quite unsuited to show their gifts. While no one could fail to admire their works in St. Mark's, it must be confessed that they were inferior in effect to the works of inferior artists. The art atmosphere in Titian's time was Palladian, not Greek. The lecture was illustrated by a large number of photographs of mosaics, ivories, textiles, &c.

Illustrations.

SAINT MARK'S, VENICE.

GROUP OF COLUMNS AT THE SOUTH-WEST ANGLE OF FACADE.

THIS drawing shows the beautiful group of columns situated at the right extremity of the façade.

Few things have charmed me more than this cluster for grace and elegance. The lower shaft is of white marble showing blue veins, those above are mottled green, red, and various, the plinth on which they stand is green; the capital supporting this is a lovely Byzantine one turned a rich golden hue. How much is new, and how much old, I dare not say.

SOUTH-WEST ANGLE OF TRANSEPT AND NAVE AISLES.

One of the many charming cross views is here shown.

In the distance, below the candelabrum, is the usual entrance from the façade. The walls are lined with mellow marble, the soffits of the arches are in mosaic—the saints always bowing to each other—giving quaintness and brightness to otherwise oppressive shadow. The angle shafts are granite, the others are marble. The thickness of the arcading makes the gallery, though corbelling out is used to get round the piers, thus allowing more light into the aisles.

ARTHUR E. HENDERSON.

SURBITON MUNICIPAL BUILDINGS COMPETITION DESIGNS.

WE publish together in this number the three designs which were "placed" in the Surbiton Municipal Buildings Competition. Our readers will remember that the Corporation of Surbiton selected for execution the design which the assessor, Mr. Mountford, placed second, and that there was a good deal of discussion in the Press, both as to the judgment of the assessor and the action of the Surbiton authorities. We thought, therefore, that it would be of some interest to publish in one number the three designs referred to, and the respective authors of the three designs have kindly seconded our intention by lending us their drawings, which would have been published earlier but for the intervention of the Cardiff competition, the importance of which demanded prior attention.

We have already made our own comment on the competition, and give the three designs here without further remarks, except that we have thought it suitable to place them in the order of the Assessor's award.

The first design is by Messrs. Wimperis & East. They write in regard to their design:—

"The plans follow the 'conditions of competition,' and were arranged to give the necessary accommodation and sizes in the most economical manner, without any projections, &c., to add to the cost. The Council Chamber was especially planned so as to obtain a certain amount of dignity and height.

The external materials were to be red brick, Portland stone, and red tiles on the roof, and the treatment generally was the outcome of a desire to express a municipal feeling combined with simplicity and economy of materials."

The second design, which is the one selected by the Council to be carried out, is by Messrs. Forsyth & Maule, who send us the following remarks in regard to their intention in the design:—

"The site is a corner one, with south west frontage to the Ewell-road. It is proposed to set the building line back 25 feet, the main entrance being into the Ewell-road for the public and staff, while a side gate is provided for the caretaker and tradesmen in the Berrylands-road.

As 5,000*l.* was the limit allowed by the conditions, it was found necessary to economise space and simplify details as far as possible, compatibly with giving all the accommodation required. As shown by the drawings, and allowing 300*l.* for entrance gates and walling, the building cubes up at 9½*d* a foot.

The various offices are placed on the ground floor, the arrangement of which is shown by the plans. The first floor provides for the Council Chamber, committee rooms, waiting-room and cloak-room, and the whole of the caretaker's apartments are placed on the second floor, as required by the conditions of the competition.

The materials to be employed in the elevations are red brick, with stone dressings and green slate roofs. All mouldings and other finishings will be of a simple character.

Internally the floors in entrance hall and vestibule are shown of marble in plain squares, those to Council Chamber and committee-rooms in pitch pine in narrow widths.

The staircases will be of stone, and provided with wrought iron balustrades.

The Council Chamber will be panelled."

Messrs. Hewitt and Ryan-Tenison, in their report, say that their building has been planned on the simplest possible lines, in order to avoid expense and any confusion in finding the several departments—"A design of free but dignified English Renaissance has been adopted which would fitly express the purpose of the building. Balustrading, parapets, and other expensive features have been carefully avoided."

The elevations would be of red brick, relieved with dressings of Monks park stone; the floor fireproof throughout, and the roofs to be covered with green Westmoreland slates.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fifth general meeting (business and ordinary) of the session 1897-98 of this Institute was held on Monday, at No. 9, Conduit-street, Regent-street, Mr. E. A. Gruning, Vice-President, in the chair.

At the conclusion of the business meeting the deed of award of the prizes and studentships for 1897-98, made by the Council (in accordance with the terms of By-law 66), in writing under the common seal, was read by the Chairman.

The Essay Medal and 26l. 5*s.*—One essay was received for the Silver Medal, under the following motto: "Heir of all the Ages," but the Council decided not to award the prize.

The Measured Drawings Medal and 10l. 10*s.*—Six sets of drawings were sent in, of the several buildings enumerated, and under motto or device, as follows:—(1) A Flower (device): Thaxted Parish Church, Essex; (2) Clare: Clare College, Cambridge; (3) Kot: The Cloisters, Norwich; (4) Dum Spiro Spero: Queen's College, Cambridge; (5) Labor omnia vincit: The Charterhouse; (6) A White Horse (device): Church of St. Helen, Cliffe at Hoo, Kent. The Council has awarded the Silver Medal and ten guineas to the delineator of Clare College, Cambridge, a set of drawings submitted under motto "Clare" by Mr. T. Tyrwhitt, and a Medal of Merit to the drawings of Thaxted Parish Church, submitted under the device of a Flower by Mr. Cyril Wontner Smith.

The Soane Medallion and 100l. — Five designs for a Concert Hall were submitted under the following mottoes:—(1) "Pan"; (2) "Lyra"; (3) "34° South"; (4) Cornice; (5) Quod erat faciendum. The prize was not awarded.

The Pugin Medal and 40l.—Four applications were received for the Pugin Studentship from the following:—(1) Mr. James B. Fulton (London); (2) Mr. Benjamin Bower (Birmingham); (3) Mr. Charles de Gruchy (London); (4) Mr. Ramsay Traquair (Edinburgh). The Council have awarded the medal and a sum of 40*l.* to Mr. Charles de Gruchy, and a Medal of Merit and five guineas to Mr. Benjamin Bower.

The Owen Jones Studentship and 50l.—Two applications were received for the Owen Jones Studentship, from the following:—(1) Mr. Frank Lishman, London; (2) Mr. Ralph Scott Cockrill. The prize has not been awarded.

The Tite Certificate and 30l.—Nine designs for a Villa and Ornamental Garden in the Italian style were submitted, under the following mottoes and devices:—(1) Triangle within circle (device); (2) Andante; (3) Van-der-Neer; (4) Heather; (5) Orion; (6) Italian Grandeur; (7) White Star (device); (8) Lorenzo; (9) Tiber. The Council have awarded the Certificate and a sum of 30*l.* to the author of the design bearing the motto "Andante" (Mr. John Stevens Lee), and a Medal of Merit and ten guineas to the author of the design bearing the motto "Heather" (Mr. Thomas A. Pole).

The Grissell Medal and 10l. 10*s.*—Twelve designs for a Small Country Church were submitted, under the following mottoes and devices:—(1) "Westminster;" (2) Simplex; (3) "Ajax;" (4) Thistle (device); (5) . T . (in red ink); (6) Tudor Rose (device); (7) A Carpenter's Plane (device); (8) Fortis Gracilisque.

(9) "By Lamplight;" (10) Emce; (11) Doan Tu Nomi; (12) Stavekircke. The Council have awarded the Medal and ten guineas to the author of the design bearing the motto "Stavekircke" (Mr. Harbottle Reed), and a Medal of Merit to the author of the design bearing the motto "By Lamplight" (by Mr. W. Stanley Bates.

The Aldwinckle (extra) Studentship (50l.).—The Council having decided to award the Studentship for the year 1898 to the person who, among all those submitting works for the prizes and studentships 1897-98, will, in their opinion, best carry out the donor's intentions, have selected Mr. James B. Fulton.

The Ashpitel Prize.—The Council have, on the recommendation of the Board of Examiners (Architecture), decided not to award the Ashpitel Prize for 1897.

The Arthur Cates Prizes.—Prizes of books to the value of ten guineas, offered by Mr. Arthur Cates, ex-Chairman of the Board of Examiners, to the students whose Testimonies of Study for admission to the Final Examination are considered by the Board to best merit the prize, provided they pass the Examinations for which the said Testimonies are submitted, have, on the recommendation of the Board of Examiners (Architecture), been awarded to Mr. Percy Morris (London) for the June Examination, and to Mr. Laurence Hobson (Liscard, Cheshire) for the November Examination.

Travelling Students' Works, 1896 and 1897.

The Pugin Student, 1896.—The Council have approved the work executed by Mr. Cecil Claude Brewer, who was elected the Pugin Student of 1896, and who travelled in the counties of Essex and Suffolk.

The Soane Medallist, 1897.—The Council have approved the work executed by Mr. John Alexander Russel Inglis, who was awarded the Soane Medallion in 1897, and who travelled in Italy and Sicily.

The Godwin Bursar, 1897.—The Council have approved the report of Mr. Robert Stephen Ayling, who was awarded the Godwin Bursary in 1897. Mr. Ayling visited Paris for the purpose of reporting upon the Abattoirs and Cattle Markets there.

The Pugin Student, 1897.—The Council have approved the work executed by Mr. William Haywood, who was elected the Pugin Student of 1897, and who travelled in the counties of Hampshire, Somersetshire, and Wiltshire.

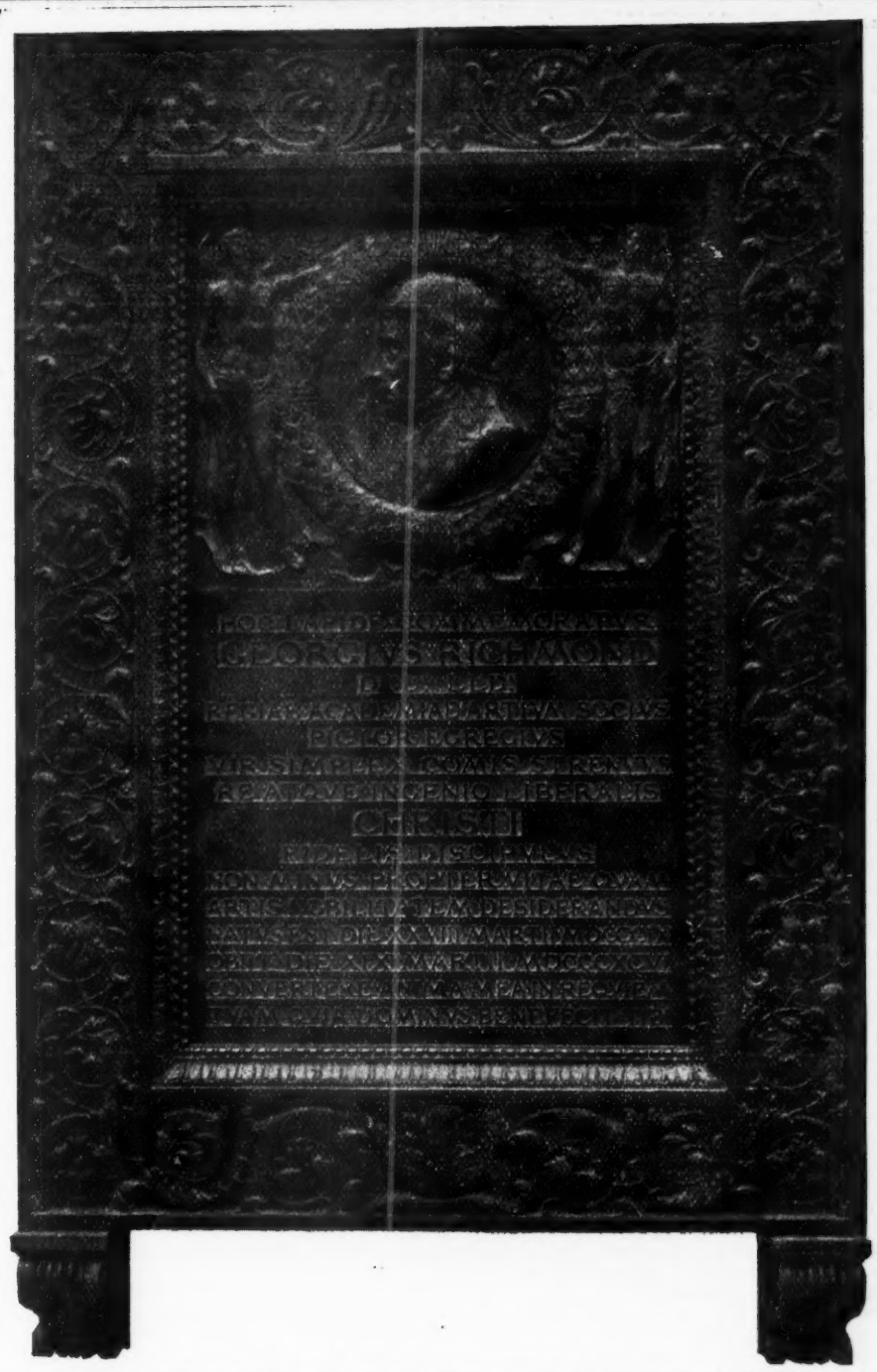
The Owen Jones Student, 1897.—The Council have approved the report and drawings executed by Mr. A. E. Henderson, who was awarded the Owen Jones Studentship in 1897, and who travelled in Greece and Turkey.

The Aldwinckle Students 1896 and 1897.—The Council have approved the reports and drawings executed by Mr. H. S. East, who was awarded the Aldwinckle Studentship for 1896, and Mr. A. T. Griffith, who was awarded the Aldwinckle Studentship for 1897. Both gentlemen travelled in Spain for a period of not less than eight weeks.

The exhibition of drawings at the Institute submitted for the prizes and studentships, and of the works of students and others, will close on the 24th inst.

The sixth general meeting (ordinary) of the session will be held on Monday, the 24th inst., when an address to students will be delivered by the President, and some critical observations made by Mr. Ernest George on the works submitted for the prizes and studentships. At the conclusion of the address the presentation of prizes will be made by the President.

RECONSTRUCTION OF BANK PREMISES, ABERDEEN.—The interior of the head office, Castle-street, Aberdeen, of the North of Scotland Banking Company, has for some time been in course of reconstruction, and the operations—consisting principally of the enlargement of the telling office—are now all but completed. The frieze in the telling-office is 2 ft. 6 in. high, and is composed of castings of the frieze of the Parthenon at Athens from the Elgin Marbles at the British Museum, reproduced by Mr. Scott Morton, London. This frieze is of bronze upon a gold ground. The various contractors were:—Mason, G. Duguid, Aberdeen; carpenter, M'Robbie & Milne, Aberdeen; plasterer and marble work, James Bannochie & Sons, Aberdeen; painter, G. Donald & Fons, Aberdeen; granite work, A. Macdonald & Co., Ltd., Aberdeen and London; Chatwood safes, fitted by D. McHardy & Son, Aberdeen. Mr. A. Marshall Mackenzie, Aberdeen, is the architect, and Mr. Murray is the clerk of works.



Memorial Tablet to the late George Richmond, R.A., St. Paul's Cathedral.

MEMORIAL TABLET TO THE LATE GEO. RICHMOND.

THE tablet here illustrated was placed a few weeks ago in the crypt of St. Paul's Cathedral by the sons and daughters of the deceased painter.

The bronze medallion with the wreath and supporting figures, were modelled by Sir W. Richmond; the tablet of *rosso antico* marble, with its ornamental border, was adapted by Mr. John Richmond from an ancient altar figured in Tatham's work on classical ornament. (Tatham, who was an architect, was Geo. Richmond's father-in-law.) The inscription, which was written by Mr. Justice Kennedy, is as follows:—

HOC LAPIDE COMMEMORATUR
GEORGIUS RICHMOND
D.C.L. LL.D.
REGIAE ACADEMIAE ARTIUM SOCIVS
PICTOR EGREGIVS
VIR SIMPLEX COMIS STRENUUS
RE ATQUE INGENIO LIBERALIS
CHRISTI
FIDELIS DISCIPULUS
NON MINUS PROPTER NOBILITATEM VITAE
QUAM ARTIS DESIDERANDUS
NATUS EST DIE XXVIII MARTII MDCCCIX
OBIIT DIE XIX MARTII MDCCCXCVI
CONVERTERE ANIMA MEA AD REQUIEM TUAM
QUIA DOMINUS BENEFECIT TIBI.

The marble was carved in the workshops of Messrs. Farmer & Brindley, and the bronze casting was executed, by the *cire perdue* method, by Messrs. Singer & Sons, of Frome.

COMPETITIONS.

SCHOOL AT DENTON HOLME, CARLISLE.—Forty-five sets of plans were submitted in the recent competition for schools at Denton Holme, for the Carlisle School Board. Mr. E. R. Robson, of London, was the assessor, and the premiums were 20*l.* and 10*l.* The following is the order in which some of the designs have been placed:—1. "Red Circle," Mr. W. Rushworth, Croydon; 2. "99," Mr. J. M. Bottomley, Middlesbrough; 3. "Strength and Grace," Mr. H. P. Burke-Downing, Westminster; 4. "Holme," Mr. Stephen Piper, Newcastle-on-Tyne; 5. "Light and Air," Messrs. Hunter, Crawford, & Carfrae, Edinburgh; 6. "Knowledge," Mr. W. Y. Hobbiss, Southend-on-Sea; 7. "Plan," Mr. S. Jackson, Fenchurch-street, London.

SCHOOLS, WESTBURY-ON-TRYM.—Mr. Edward Gabriel (Edmeston & Gabriel), the assessor appointed by the committee of the Westbury-on-Trym National Schools, Gloucestershire, in connexion with the recent limited competition for new schools, has placed the design submitted by Mr. W. L. Bernard first, and that of Mr. H. Hirst second in order of merit, and the selection has been confirmed by the committee.

SEWERAGE SCHEME, MORECAMBE.—At a special meeting of the Morecambe District Council on the 14th inst., the twelve competitive schemes for the sewerage of the district were again considered, and eventually one submitted by "Forward" was adopted. This scheme will serve for a population of 60,000.

The estimated cost of the works is 39,227*l.* 10s. 9d. (exclusive of way leaves, engineering, or land), with an estimated annual working expenditure of 620*l.* 2s. 6d., for a population of 45,000. To this must be added the cost of the septic system, which has been agreed to, and which will form a part of the scheme. The successful competitor is Mr. H. B. Nichol, C.E., of Birmingham. The cost of the schemes submitted varied from 19,000*l.* to 66,000*l.*—*Bradford Observer.*

NEW WORKHOUSE AND OFFICES FOR THE FYLDE UNION, KIRKHAM.—Sixteen sets of plans have been received in this competition, and the Guardians have appointed a Fellow of the Institute of Architects as assessor.

CONTINENTAL OPINIONS REGARDING THE CRIPPLEGATE FIRE.

WE have had occasion to refer to an investigation of the Cripplegate fire, which was undertaken by the Hamburg authorities, but we avoided giving particulars of their report until after the inquest which was being held at the Guildhall. It may now, however, be of some use to know what the foreign expert thinks of our methods of fire protection, especially since we have recognised the fact that, instead of being up-to-date, we are many years behind many of the American and Continental cities.

The Hamburg Commission, which comprised a representative of their Board of Works, a leading insurance official, and the well-known Chief of their Fire Department, seem to have gone into the question very thoroughly, and in many ways appear to have had greater facilities than were given even to the jury at the City inquest. They were not hampered by formalities; there was no arranging of evidence, but a quiet and businesslike inquiry, and all three Commissioners had the advantage of being experts, whilst two of them should be termed authorities on questions of fire hazard.

These gentlemen seem to have come to the conclusion that we are in a very bad way indeed, and, to put it plainly, are even behind the small provincial towns of northern Europe, not to speak of such cities as Vienna, Hamburg, Bremen, &c. But, of course, these experts do not judge us by the physique of our firemen, the brightness of our engines, our horseflesh, or even Mr. Blashill's excellent fire stations. They take fire protection as a whole, and actual fire brigade work (that is to say, the extinguishing of a fire) takes a secondary position with them compared with the preventive measures and the research work on which so much stress is laid abroad. To a very great extent, the modern fire brigade official of a large Continental centre is intimately associated with the work of the Building Act department, and with such public control or municipal insurance departments as are directly interested in minimising fire risks. The chief duty of the modern fire brigade officer is to prevent a fire occurring, and not to wait for the outbreak. The second duty is to see that everything possible is done to prevent its spreading, as far as building construction and planning are concerned. The third duty is to see that, if an outbreak should occur, the fire engines are called at the very earliest moment. When all these duties have been dealt with, comes the question of actual fire extinguishing. Fire protection is treated as a science, and the officer of a fire brigade is looked upon as a member of a techincal profession. Preferably he should be an architect, surveyor, or civil engineer.

But to summarise the Hamburg report, which will be better appreciated after these preliminary remarks as to the view taken by our Continental critics, we would only say that our disregard for safe construction is ridiculed, that the absence of interest in fire prevention, so obvious in the fire brigade, is scoffed at as being out of date; and, finally, our fire brigade is pulled to pieces, with the one exception of its *personnel*, for which the Commissioners certainly have great admiration.

We have not space to enter into detail regarding their remarks on our methods of construction, or an explanation of the reasons why these critics think our fire brigade officers cannot give attention to fire prevention. We would only here speak of a few remarks regarding the methods of the fire brigade, which should be read together with the suggestions made by the Guildhall jury and referred to in our last issue. Our Hamburg critics tell us that, quite independent of the fact of London being undermanned as it is, no less than 200 men of the small force at our disposal were lying idle at their stations during the Cripplegate fire, and that nobody, apparently, thought of sending for them, though they were badly wanted on the spot, and there were plenty of horses standing by which could have been used for bringing them up. Then we are told that our firemen were badly handled at Cripplegate, or, rather, not handled at all, it being the custom of each small group of men to do practically what they liked. According to the Hamburg critics, there was no central control worthy of the name. There were no tactics; and much else that did not bear the light of careful investigation.

As we remarked last week, there was an opportunity at the Guildhall inquiry to either disprove the charges if they were not true, or at least to show that every effort would be made to remedy the defects mentioned. We repeat the criticisms for what they are worth. They are given by officials of high standing and extensive experience, and in an official capacity. It is unpleasant to hear from abroad that leading authorities are clearly of the opinion that the Cripplegate fire need not have been as extensive, and could have been cut off either at Jewin-street or Jewin-crescent, if we had been in the possession of a satisfactory organisation, and if our men had been well handled. This question of an efficient fire brigade has become one of vital importance, since our risks are constantly increasing, and the efforts which are being made for the adoption of preventive measures must naturally take many years before they have any perceptible effect. Even when we have a better built city than we have at present, a good fire brigade will be essential, though of course it need not be as strong then. As London stands to-day, any of the faults of which our Hamburg critics tell us may easily bring about the recurrence of a great fire like that of 1666. Given such unfortunate circumstances as a strong gale of wind or two important outbreaks commencing at the same time, we must have a catastrophe. Hence the sooner we reform our brigade and take up fire-prevention seriously, the better for the Metropolis.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The sixth meeting of the present session was held at 56, Great Marlborough-street, on the 12th inst., Mr. Matthew Garbutt, Chairman of the Section, occupying the chair. The paper of the evening was entitled "The Symbolism of Ecclesiastical Architecture," by Mr. Alfred Hale, A.R.I.B.A., of Birmingham. After some introductory remarks on the large part symbolism had played from the earliest days of Christianity in determining the forms and details of churches, Mr. Hale proceeded to describe the symbolic meaning attaching to the various parts of an ecclesiastical edifice. He quoted Eusebius, Candidus, and Socrates to show the early use of symbolism in the forms of churches. In this country the Norman style might be said to symbolise facts, the Early English doctrines. The saying that Christ ascended into heaven towards the east, "and shall come again in like manner," explains the orientation of churches, the congregation looking towards the east. The doctrine of the Holy Trinity was symbolised by many triple divisions of parts—by three towers, by three steps to the altar, three-light windows, arch mouldings consisting of three distinct groups, &c. The Atonement was symbolised by the cruciform plan (the curious deviation from the straight line being supposed to represent the inclination of Christ's head upon the Cross); regeneration by the shape and ornament of fonts, and their position in the church; the separation of the Church Triumphant from the Church Militant by the chancel arch, which in early days was made narrow to signify the straightness of the entrance to the Kingdom of Heaven. Similarly minor doctrines of the Church, the sayings and miracles of Christ, the Divine Attributes, the martyrdom of the saints, &c., were represented by the disposition of mouldings, the shape and ornamentation of doors and windows, and by various decorative forms. In the use of colour and precious stones, white and silver expressed purity and joy; deep red, the Passion; green, hope; violet, sorrow; blue, heaven; black, death; and so on. Mr. Hale made copious references to buildings in which examples may be seen of the forms he described, and exhibited a fine collection of diagrams illustrative of architectural symbolism, which had been kindly lent by Mr. Doubleday, of Birmingham. The next meeting will be held on the 26th inst., when Mr. E. Herbert will read a paper entitled "Architectural Commission, Who Receives it?"

THE ARCHITECTURAL ASSOCIATION OF IRELAND.—A general meeting of this Association was held in the Grosvenor Hotel, Dublin, last week. The President delivered a most interesting lecture on the artistic treatment of architectural perspective. He illustrated his remarks by reference to original drawings by Messrs. T. Raffles Davison, C. W. English, and others, lent by various architects. The lecturer also showed some etchings, pointing out the error into which many draftsmen fell—that of imitating the methods of the etcher. He also laid stress on the almost invariable neglect of "tone" in architectural drawings, whereby much work otherwise of considerable merit was spoilt.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—On Tuesday, the 11th inst., Mr. J. Kennedy Hunter, of Ayr, read a paper on "Some Points in Practice," the President, Mr. Wm. Tait Conner, occupying the chair. The lecturer spoke of the relations of the architect to the client, the contractor, and to his fellow architects. He favoured a fixed fee rather than a percentage; thought an architect had no option but to grant a certificate to a contractor for work done, less the usual percentage; objected to architects' guarantees in competitions, preferring an estimate by a skilled measurer, and concluded by cautioning the members against accepting responsibility for the clerk of works, who was the client's servant. Mr. W. J. Anderson opened the discussion, and said he hardly knew whether the client who did or who did not employ one was most troublesome. Mr. W. F. McGibbon agreed that good architects deserved the standard percentage, but thought the fact that some got half or a quarter of that was scandalous. Mr. John Fairweather did not object to lump sum fees if they were large enough.

ELECTRO-CHEMICAL INDUSTRIES.

MR. J. W. SWAN, F.R.S., was particularly happy in the choice of a subject for his presidential address to the Institution of Electrical Engineers. The rise and progress of electro-chemical industries have been so rapid that few people are aware of the large and profitable industries dependent on electrolysis and the use of the electric furnace which have sprung up during the last six or seven years. Although an immense amount of work has already been done in this field, yet so fertile has it proved that we heartily endorse the advice of Mr. Swan to young electricians that they should specialise in electro-chemistry. It is, nowadays, a profession in itself, and many of the appliances used were unheard of ten years ago.

One-third of the pure copper used in the world is produced electrolytically, and, considering the immense quantities used for electric lighting and traction purposes, this is to be measured in hundreds of tons per diem. One company alone, the Anaconda Copper Company, produces on an average over 100 tons of refined copper per diem, and has a plant capacity of nearly double this. Twelve years ago the price of aluminium was 2*l.* 10s. per lb., now it can be got for 1s. 5d. The great reduction of price is due entirely to the development of the electrical methods of obtaining it. The cost of aluminium and copper are now, bulk for bulk, the same, and it seems probable that aluminium will very soon stand next to iron in its usefulness and price.

Perhaps the most important of all the applications of electro-chemistry at the present time is the manufacture of alkali, several electrolytic methods being employed for the production of caustic alkali, and chlorine. Mr. Swan mentioned specially three methods which are extensively employed, namely, the Hargreaves-Bird, the Castner-Kellner, and the Richardson and Holland processes, but it is too early yet to state which is the most profitable. A thousand horse-power plant was started four months ago in this country to work the Castner-Kellner method, and two others, one of 2,000 horse-power, and the other of 1,000 horse-power, are in course of erection, and are expected to be in working order in July. On

the Continent three large works are in operation, and the American Mathieson Company, at the Niagara Falls, have just commenced manufacturing bleach and alkalies on an enormous scale. It must also be remembered that many electrolytic patents will soon expire, and that when royalties cease to be paid we may expect still further reductions in price.

The electrical methods of producing potassium and sodium by electrolysis of the fused hydrate have been perfected by Castner, and are now successfully employed. The market for these metals is, of course, small, but it is now wholly supplied by the electrolytic companies.

The recovery of gold from the gold-bearing ores or amalgamator tailings is now being done on a large scale by means of the Siemens-Halske process. Formerly gold was extracted from its ores on a small scale by the amalgamation or chlorination process; now by the electrical process tailings are treated in tanks having a capacity of two hundred tons, and the slimes in vats capable of holding one thousand tons. The difficulties to be overcome were very great, and that the cost of the process is only about a third that of the chemical precipitation process shows how successfully they have been overcome. The solution, which circulates through the vats at the rate of a thousand gallons per hour, contains only a few pennyweights of gold per gallon when it enters the first tank, and only a few grains when it leaves the last one. The extraction efficiency of the plant of the Rand Central Reduction Company is 70 per cent., and it treats three thousand tons of tailings by this method a month.

The Cowper-Coles method of electro-plating with zinc (true galvanising) is worked by several firms in this country, and is of special importance in the construction of boiler tubes. In Switzerland and Sweden, where water power is cheap, chlorate of potash is manufactured electrolytically, and this method will soon supersede the chemical method.

In addition to the electrolytic industries there are several electro-thermic industries depending on the great heat which can be developed in the electric furnace, and the ease with which the heat can be regulated. The manufactures of carborundum, carbides especially calcium carbide, and graphitic carbon blocks for anodes are a few of the industries depending on the electric furnace.

Alternating current has been employed by Mr. Andreoli for the production of ozone on a commercial scale. Its cost of production is about 40*l.* per ton. At present the applications of ozone are limited, but it is highly probable that it will be used largely in the future. It is used for bleaching varnishes and oils, for starch purification, and in conjunction with chlorine for bleaching textile goods. Experiments are being carried out on its use for purifying vitiated air and for sterilising fluids.

Mr. Swan made some interesting remarks as to how far the availability of water supply as a cheap source of power would affect the location of electro-chemical works, and gave the following table showing how many electrical horse-power hours were consumed in the production of 1 lb. of the following substances:—aluminium, 14; nickel, 1; sodium, 3·3; caustic soda + 2 lbs. bleaching powder, 2·7; chlorate of potash, 5; zinc extraction, 1; copper, 0·5; copper refining, 0·25. It follows that factories for aluminium and for electro-thermic products, as carborundum, carbides, &c., will be situated where water power is cheap. When, however, the cost of power is not relatively so important as in copper refining, alkali manufacture, &c., then the works will probably be located where coal is fairly cheap. In Lancashire several factories use steam power for the production of caustic soda and bleaching powder, and they easily compete with factories situated where water power is cheap.

In our opinion, Mr. Swan took too gloomy a view of the prospect of the direct conversion of heat into electric energy. He was right, however, in pointing out that the dynamo had little to fear from its rivals at present. Until a radical change has been made in the construction of all primary batteries they will never be employed on a large scale. The trouble of renewing the anodes and electrolytes fatally handicaps them.

We must warn the young electrician that unless he has a thorough knowledge of chemistry his chances of success are small. A good chemist, even if he has very little electrical knowledge, has better prospects in this field. During the last year several good books on electro-chemistry have been published, but they seem very little known. It is a matter of congratulation that although teachers in our technical schools are badly paid and their laboratories, if they are fortunate enough to have any, poorly equipped, yet so many of them keep abreast of the tide of scientific progress. Manufacturers also are now thoroughly alive to the value of electrolytic methods, and inventors have little trouble in getting them to give their methods a trial.

BOOKS RECEIVED.

SOILS AND SUBSOILS. By Horace B. Wood. (Memoirs of the Geological Survey.)

WHAT IS FIRE PROTECTION? By Edwin O. Sachs. SOME AMERICAN OPINIONS ON FIRE PREVENTION. THE PARIS CHARITY BAZAAR FIRE: By Edwin O. Sachs. (British Fire Prevention Committee).

NINTH REPORT ON TRADE UNIONS, 1896. By the Chief Labour Correspondent of the Board of Trade.

Correspondence.

To the Editor of THE BUILDER.

THE INQUEST ON THE CRIPPLEGATE FIRE.

SIR,—Referring to the important leading article on the Cripplegate fire inquest in your issue of 15th inst., allow me to suggest that the gentlemen who asserted at the inquest that the buildings destroyed by this fire were constructed in accordance with the regulations of the Building Act in force at the time of their erection, should name their authority for such assertions.

This is certainly desirable in view of Section 19 of the 1855 Act, which restricts the slope of a roof for a warehouse or other building used wholly or in part for the purposes of trade or manufacture to an angle of 47 deg.; and also in view of Section 13, which states that, for all buildings, the area, taken together, of recesses and openings in external walls, shall not exceed one-half the whole area of the wall in which they are made.

There was evidently no doubt in the minds of the jury that the buildings destroyed were included in the foregoing or "Warehouse Class," otherwise their recommendation that match lining for walls and ceilings in such buildings should be forbidden would be nonsense.

Most of the warehouses destroyed were covered with "Mansard roofs," many of which had an inclination of about 80 deg. instead of 47 deg., and the openings in many of the external walls, especially those round open light areas, greatly exceeded half the area of the wall in which they were made.

These evasions of the clear meaning and intention of the Building Act are mainly responsible for the alarming spread of the fire.

In this connexion it may be well to draw attention to the case of the Great Tooley-street fire in 1861, with regard to which the District Surveyor stated, before the Parliamentary Select Committee on Fire Protection, on July 4, 1867, in reply to question 6367, that he had objected to the erection of a building exceeding 500,000 cubic feet (which huge building was mainly responsible for the spread of that fire), and brought the case before a magistrate, who decided that a so-called fireproof floor supported on bare iron girders and columns was a party wall.

If this evasive decision had been properly challenged at the time, instead of being left until 1892, after which date it was set aside by the Court of Queen's Bench, this large warehouse would have been divided by party walls and the area of the Tooley-street fire in all probability greatly restricted, and the subsequent erection of many dangerous buildings would have been prevented.

A disastrous conflagration, after repeated warnings, now occurs in consequence of evasions of the provisions of the Building Act, with regard to warehouse roofs and the extent of window openings.

This part of the subject urgently calls for the immediate consideration of the Building Act Committee of the County Council, who, with their predecessors, appear to be more responsible for the extent of this conflagration than the Fire Brigade Committee.

CURFEW.

COLOUR THEORIES AND DECORATION.

SIR,—I am afraid that, in endeavouring to be brief in a former letter, I failed to make clear why I do not think Chevreul's book one to assist the practical student of decoration, but rather to embarrass and mislead him.

In the first place, Mr. Chevreul was a scientist—a very thoughtful and observing one, with a careful eye for phenomena, so far as they can be produced by experiment in the laboratory or lecture hall; but he was lacking in the artistic qualities which give an insight into the true bearings of his phenomena when applied to objects of daily life "in the round," affected as these are by light and shade, reflected light, and other bye-conditions. Consequently, though his *experimental* deductions are, as a rule, very correct, his further or external application of them is often partially or wholly incorrect; and a student has not experience or training enough to know where he is wrong.

Then, it can hardly be treated as a matter of indifference that Mr. Chevreul was not aware that the so-called "primaries" of the spectrum are not identical with those of the palette—that blue and yellow, when combined by optical means, make grey or white, *not* green, as they do when the pigments are combined on the palette.

Chevreul wrote his book, I find, in 1835. It is only requisite to consider what was the state of art and the taste in colour in France at that date to realise that the artistic influences to which Mr. Chevreul was open at the time of his experiments were not such as to exercise a very valuable control on his deductions, and taste was certainly at a very low ebb at the Gobelins factory.

Chevreul did a great work by his book, and opened a very valuable path of study. It should be no reproach to him that he has led many a colourist into crude combinations and artistic blunders. Further research has enabled others to supply the needed qualifications of his results; and it is, therefore, not wise to set before beginners a voluminous and elaborate work requiring the closest attention, when all that is most valuable can be found, in more accurate form, in more modern handbooks.

J. D. CRACE.

HARD CEMENT ON WALLS.

SIR,—Mr. L. A. Shuffrey's letter in your last issue does not quite reply to the queries of "H. W."

I fully agree with your other correspondent that efflorescence on hard cements is usually due to Portland cement having been used in the brickwork or in the rendering. Sometimes, however, the bricks themselves effloresce, and this efflorescence passes through the hard cement, evaporating and leaving a powder on the surface.

The hard cement usually gets the blame, however, and very unjustly so.

There is little difference in behaviour with regard to the above, whether Parian, Keene's, or Martin's cement be used.

With lime mortar, and a rendering of the particular hard cement and sand, there is no fear of efflorescence, *unless it should come from the bricks themselves.*

If the wall (however built) and plastering are allowed to become thoroughly dry before painting, the evil will be certainly avoided, whatever it may arise from.

It is quite safe to plaster a wall on both sides with hard cement, as the moisture passes through the latter, either perceptibly or imperceptibly, and this would hold good, whether the wall were built in lime mortar or otherwise.

W. J. K.

"ST. CHAD'S CHAPEL," LICHFIELD CATHEDRAL.

SIR,—One would like to know whereabouts in Lichfield Cathedral this old-new or new-old chapel, the "restoration" of which was chronicled in your last number, is; it does not appear to be shown even as a ruin in the plan of the cathedral included in your Cathedral series (*Builder*, February 7, 1891).

One would also like to know exactly how much of it is old and how much new.

H. E. T.

*** The chapel is over the Sacristy; this should certainly have been mentioned. For the rest, we gave pretty full details as to what was done in the restoration. We may add, however, that the wall-ribs as well as the springers are ancient, the remainder of the vaulting is new.—ED.

BATTERSEA BATHS COMPETITION.

SIR,—The error, which Mr. A. Hessell Tiltman calls attention to, in the notice of the above competition, was caused, primarily, by the way in which the designs selected for exhibition were arranged and numbered (the figures 1, 2, and 3 having been added to the letters by which the several designs were originally distinguished), and was confirmed by the impression produced, after examination and comparison of these designs, that no other order of merit was possible; but that the third, instead of the second premium, should, after all, have been awarded to Mr. Tiltman's design, can only be regarded as one of those competition mysteries which pass all understanding.

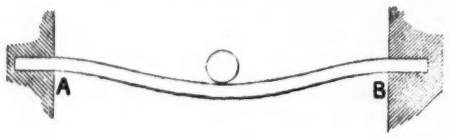
THE WRITER OF THE ARTICLE.

STATUE OF BOADICEA.—The model of the statue by Mr. Thomas Thornycroft of Boadicea, the British Warrior Queen, was placed in position on the Thames Embankment, immediately facing the House of Commons, on the 15th inst., in order that the members of the London County Council might view it. The figure of Boadicea, which stands 18 ft. high, is represented in a chariot, supported on either side by female warriors.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—IV.

THE formula which we have investigated and used for calculating the strength of a timber beam assumes that the ends of a beam merely rest upon their supports. If one or both ends of the beam are rigidly fixed so as to be prevented from tilting on the edge of their support a very considerable increase of strength results, the amount of which has been determined by experiments and can be investigated analytically, but for this purpose the student's knowledge of mathematics must be very much greater than we have assumed, and, indeed, more than can be expected from the majority of architects. If, however, we suppose as shown in the diagram



that a beam A B of uniform cross section is fixed at both ends and loaded at the centre, it does not require any advanced mathematics, but only ordinary perception, to see that the result would be the bending somewhat in the form shown in the diagram.

It is sufficiently near accuracy to take the strength of the beam fixed at one end and supported at the other as 1¼ W, where W is the strength of a similar beam under similar conditions, but supported only at both ends without being rigidly fixed. If the beam is rigidly fixed at both ends its strength is then 1½ W. The student must, however, be cautioned that in actual practice, beams with fixed ends very rarely occur, and are indeed open to strong objections. If the beams are of timber, the rigid fixing and consequent confinement of the ends of the beam leads to their decay. If the beams are of iron, the rigid fixing prevents their free expansion and contraction. Practically, therefore, the only cases in which the ends of a beam may be supposed to be rigidly fixed are when the beam is continuous over one or more supports, and loaded with a distributed load.

It sometimes happens that it is desirable not only to find the strength of the given beam or the necessary scantling to obtain a certain amount of strength or do a certain amount of work, but it is necessary to make calculations on the deflection or bending of the beam or conversely of the necessary scantling of a beam to avoid deflection or bending. This, therefore, brings us to the question of deflection, for which a fairly simple formula will suffice.

The deflection of a beam depends upon its elasticity, and is also affected by the relation between the scantlings. It has been found by experiment that the deflection varies inversely as the cube of the length, and directly as the breadth and as the cube of the depth. The load upon a beam is also necessarily a determining factor of the amount of deflection. The deflection, however, does not precisely vary directly with the load, but as the load increases the deflection increases more and more rapidly. To estimate this with precision by means of a formula would demand more advanced mathematics than can be expected from a student, and in practice it is usual to assume that the deflection does vary directly with the load. This is very nearly true within the limits of the elasticity of the material. After the elastic limit is passed the deflection increases irregularly, and more rapidly than before. As the weight of the beam itself has considerable effect in producing deflection it is necessary to add five-eighths of the weight of the beam over the span to that of the actual load in order to rightly estimate the deflection. With these explanations we may now proceed to give a formula for rectangular beams :—

$$SD = \frac{WL^3C}{BD^3}$$

where SD is the deflection within the safe or elastic limit in inches, W is the total equivalent of the centre load in tons, L the span in feet, C is the constant, B the breadth in inches, and D the depth in inches.

The constants which may be used in this formula are :—For oak, 0·5 ; fir, 0·7 ; cast iron, 0·06 ; Wrought iron, 0·04 ; steel, 0·03. All these constants vary somewhat with the quality of the material, particularly those relating to timber.

What we have said in the beginning of this chapter about the cases of beams fixed at one or both ends does not precisely hold good with deflection. The student will already have seen by comparison of the formula given above for deflection that this stands on a very different footing from that for the strength or breaking weight of a beam.

If the deflection of a beam supported at both ends, and loaded at the centre, be taken as unity (1), that of the same beam, with the same load uniformly distributed, will be ⅝. If firmly fixed at both ends and loaded at the centre, ⅛ : if firmly fixed at both ends and uniformly loaded, 1/32 ; if fixed at one end and loaded at the other, 16 ; if fixed at one end and uniformly loaded, 6. These last two cases are, of course, those of cantilevers, which are, and may be, described as beams fixed at one end and loaded at the other.

The amount of deflection which may be allowed in structures is dictated by various considerations. First of all, we have the limit of elasticity of the material. The elasticity of material is, of course, that power which it has of resuming or returning to its original form after deflection ; and the limit of elasticity is the measure of the amount of deflection which material can undergo without becoming permanently distorted. This, of course, varies with different materials: hence the variation in the constants which we have given above for different materials. When material is strained beyond its limit of elasticity it is so far deflected or distorted as to be unable to resume its original form ; when this has occurred, material is said to have received a permanent set, and is in a condition which indicates that it is prejudicially strained. The proportion of the breaking load which is sufficient to produce a permanent set varies with different materials. In the case of timber a load of one-fiftieth of the breaking-load will, if continued for a few months, produce a permanent set. But for practical purposes the elasticity of a wooden beam is not materially injured if the quiescent load does not exceed about one-third of the breaking one. It has been assumed by Tredgold and others that in order that timber should not cause the plaster of ceilings to crack a beam should not be deflected at its centre more than $\frac{1}{480}$th part of the span.

The question of elasticity and permanent set is closely connected with the property of material which we have already described as "fatigue of material." Whether the application of the stress be repeated and recurrent, or whether it be long continued, in either case under the stress the material loses something of its initial strength, or, as the term well implies, becomes fatigued. Within the limit of the elasticity of the material the number of repeated applications of the stress is enormous, say, about forty million times ; but it may be said with truth that a repeated or continuous application of any stress, if carried on for a sufficient length of time, will break the material.

As a general rule, it may be taken that the limit of elasticity of any material is about one-third of its tensile strength. Another formula, which may be used for calculating the deflection of beams, and one which applies more accurately for various forms of beams, is :—

$$D = \frac{n w l^3}{EI}$$

where D is the deflection in inches, w the total equivalent load on the beam including the proportion of its own weight, l the length of the beam in inches, E the value of the modulus of elasticity of the material, I the moment of inertia about the neutral axis of that section of the beam where the greatest stress occurs with the given distribution of load ; n is the co-efficient, the value of which is given for different classes of beams and different distribution of loads by Professor Rankine as under :

Beams of uniform cross section.

Fixed at one end, loaded at the other	1/15
Fixed at one end, loaded uniformly.....	1/8
Supported at both ends, loaded in the middle	1/10
Supported at both ends, uniformly loaded...	5/48

Beams of uniform strength and uniform depth.

Fixed at one end, loaded at the other	½
Fixed at one end, loaded uniformly	⅔
Supported at both ends, loaded in the middle.....	¼
Supported at both ends, loaded uniformly	⅜

Beams of uniform strength and uniform breadth.

Fixed at one end, loaded at the other.....	½
Fixed at one end, uniformly loaded.....	⅔
Supported at both ends, loaded in the middle.....	½
Supported at both ends, uniformly loaded	0.1427

OBITUARY.

MR. GEORGE KERRICK-WALKER.—The death of Mr. George Kerrick-Walker, architect, took place at Chester-le-street on the 10th inst. Deceased, who was attacked by paralysis some time since, died at the age of thirty years.

GENERAL BUILDING NEWS.

PRIVATE CHAPEL FOR THE DUKE OF FIFE.—A small private chapel is at present being built by the Duke of Fife at his residence, Mar Lodge, Braemar, Aberdeenshire. Mr. A. Marshall Mackenzie, Aberdeen, is architect, and Mr. Edgar Gauld, Aberdeen, has the contract for the masonry of the chapel, which will be of granite, both inside and outside.

MANCHESTER CATHEDRAL IMPROVEMENTS.—The Dean of Manchester has issued a circular with regard to the new west porch of this cathedral, in which he says that the deviation in the street line and footpath at the west end of the cathedral, agreed to between the Corporation of Manchester and the ecclesiastical parties concerned, has necessitated some rearrangement of the precincts in front of the tower and of the ascent into the church itself. The matter was for some time under very serious consideration by the Dean and the late churchwardens, in conference with Mr. Basil Champneys, architect, by whom a design was at length prepared. So deeply, however, did the authorities feel the responsibility of undertaking this work that they further called into consultation Mr. Bodley, who presented them with a report approving of Mr. Champneys' design. A committee was subsequently formed for the purpose of carrying out the design, and, tenders having been invited, a contract was entered into for a portion of the work now in progress. The object specially sought to be accomplished is the provision of a covered approach to the Cathedral, to be used on state occasions by ecclesiastical and civil dignitaries, the Lord Bishop of the diocese, Her Majesty's Judges of assize, the Lord Mayor and Corporation of the city, or other public bodies. Abutting on Victoria-street, and commenced in the sixtieth year of Her Majesty's reign, these buildings are known as the "Victoria Porch," or Galilee, and a niche has been prepared for the reception of a statue of Her Majesty, to which will be added, as funds accrue, figures of other notabilities in Church and State. The central portion only is as yet contracted for. The committee now appeal for funds, which they wish to raise immediately, that the wings on the north and south sides of the porch proper may be proceeded with whilst the appliances for building are on the site.

CONSECRATION OF ST. MICHAEL'S CHURCH CLAUGHTON.—The new church of St. Michael and All Angels, situated on the north side of Carlton-road, Claughton, was consecrated recently by the Bishop of Chester, Dr. Jayne. The new church, when completed, will provide seating accommodation for 800 persons, but the portion now built consists only of the chancel, choir, transepts, and one bay of the nave arcade, and will seat 440 persons. The west wall will be removed when the remaining two bays of the nave and the west gable are built, and the nave will be 84 ft. in length by 33 ft. in width, and with a height of 46 ft. to the apex of the roof. The building was designed by the architects, Messrs. F. & G. Holme, Liverpool. The plan of the completed church comprises the nave with north and south aisles and transepts, the choir with smaller north and south transepts, the former containing the organ, the choir vestry, and the chancel. The contractor was Mr. W. Hall, Liverpool.

WESLEYAN CHAPEL, HIGH BROOMS, TUNBRIDGE WELLS.—A new chapel is about to be erected at High Brooms in connexion with the Tunbridge Wells Wesleyan Circuit. The new building will be 55 ft. long by 30 ft. wide, with seats for 300 people. The building has been designed by Mr. Herbert M. Caley, of Tunbridge Wells.

EPISCOPAL CHURCH OF FOLLA RULE, ABERDEEN.—The church of St. George, Folla Rule, Rothienorman, after undergoing alteration and improvement, has been reconsecrated by the Bishop of the diocese. The whole cost of the alterations and improvements, including the new organ by Messrs. Wadsworth Brothers, Aberdeen and Manchester, has been between 1,300*l.* and 1,400*l.* The plans were prepared by Mr. Arthur Clyne, archi-

tect, Aberdeen, and the work was carried out under his superintendence. The contractors for the various departments were as follows :—Mason work, Mr. Lauder, Inverurie ; carpenter work, Mr. Watt, Inverurie ; plaster work, Mr. Moir, Inverurie ; plumber and slater works, Mr. Pirie, Fyvie ; painter and glazier work, Messrs. Donald & Sons, Aberdeen ; heating apparatus, Messrs. Rae & Sons, Inverurie.

PRIMITIVE METHODIST CHAPEL, BOSTON.—On the 13th inst. the Primitive Methodist Chapel, in West-street, Boston, which was destroyed by fire in January, 1897, and has been rebuilt and renovated at a cost of about 2,000*l.*, was re-opened. Mr. W. Greenfield's contract for the brickwork, &c., was 510*l.*, and that of Mr. Jessop, for the woodwork, 900*l.* Messrs. Hewitt, of Leicester, supplied the new organ at a cost of 250*l.* The architects were Messrs. Howdill, of Leeds.

CONGREGATIONAL CHURCH, QUEENBOROUGH, KENT.—A new Congregational church has just been opened at Queenborough. The architect was Mr. W. T. Rule, of Sheerness, and the contract was carried out by Mr. Joseph Bligh, builder and contractor, of Eastchurch. The church, which will seat 350 persons, is of brick. The extreme width of the building is 34 ft., with a length of 64 ft., the church, inside, being 51 ft. by 31 ft.

PRIMITIVE METHODIST CHURCH, AMPFIELD, HANTS.—A church, which has been erected by the Primitive Methodist body, was opened recently at Ampfield. The building is of brick, and was built by Mr. S. Collins, Awbridge, the architect being Mr. C. Harris, Boscombe.

SCHOOLS, DOVER.—The new elementary schools for Buckland parish, built in Barton Meadow by Mr. W. G. Lewis, from the plans of Messrs. Cresswell & Newman, were opened on the 7th inst., by Bishop Walsh. The building is constructed of yellow bricks, roofed with blue slates, with brown ornamented ridge tiles. There are seven rooms and two lobbies.

BOARD SCHOOLS, HUNTSPILL, NEAR BRISTOL.—New school buildings have been erected at West Huntspill, for the School Board for the combined parishes of East and West Huntspill and South Highbridge. The newly-erected schools have been built close to the main highway by Mr. H. W. Pollard, of Bridgwater, from designs prepared by Mr. A. Basil Cottam, the Board's Architect, also of Bridgwater and Taunton.

BOARD SCHOOLS, ILKESTON.—On the 10th inst. the new Gladstone-street Board Schools at Ilkeston were formally opened by the Mayor (Alderman S. Richards). The new schools have been designed on the central hall system, with separate class-rooms for each standard. There are two blocks, one for boys and girls and the other for infants. The total accommodation is for 900. Provision is made in each school for cloak-rooms and teachers' rooms. In the larger block the central hall, when the partition is removed, will be suitable for entertainments. A cookery school is also provided in a detached building. There are both covered and large open playgrounds for each school. The buildings are of red Leicestershire bricks, the roofs are covered with Broseley tiles, and the floors are of solid wood blocks laid upon concrete. The schools are heated by hot water. The approach to the girls' and infants' schools is from Gladstone-street, and that to the boys' school from Extension-street. The cost of erection, exclusive of cost of site and furniture, is 9,945*l.* The architect is Mr. C. W. Hunt, the contractor Councillor W. E. Shaw, the plumber Mr. G. Andrew, and the clerk of the works Mr. Thomas Hallam, all of Ilkeston.

INFANTS' SCHOOL, BRAINTREE.—A new Infants' Schoolroom, Manor-street, for the Braintree School Board, was opened recently. The new building is situated on the west side of the playground which divides the old and the new schools, and comprises a room, 60 ft. by 24 ft., capable of accommodating 257 children, two class-rooms, two cloak lobbies, and various offices. The builder was Mr. E. West, of Chelmsford, and the architect, Mr. J. W. Clarke, of Coggeshall.

SCHOOL BOARD OFFICES, WEST HAM.—The new offices erected for the West Ham School Board, in the Grove, Stratford, were opened on the 13th inst. The buildings have been erected from designs by Mr. W. Jacques, the Board's architect, by Messrs. W. Gregar & Son, of Stratford. The frontage of the buildings to the Grove is over 82 ft. and the offices, arranged on two floors, extend in the rear to a depth of 127 ft. On the upper floor the clerk to the board and his staff occupy the entire front, behind their rooms are committee and waiting rooms, and behind these again is the board-room—with public gallery—together with rooms for chairman and members. On the lower floor there are to the front, in addition to the main entrance hall and vestibules, the porter's lodge, the architect's office, and a room for committee meetings, whilst to the rear are other committee-rooms, with waiting-rooms and rooms for the visiting officers, &c. As this lower floor is raised above the level of the pavement outside, a basement, extending under the whole of the offices, has been obtained. The building is lighted throughout by electricity, and the plant which supplies the current also lights the Pupil Teachers' Centre in Water-lane. The principal corridors are in mosaic, and throughout the building the floors, and the greater part of the roof, are of steel and concrete. The building is of red Staffordshire bricks and Portland stone.

PROPOSED NEW SCHOOL BUILDINGS, LERWICK.—At the recent monthly meeting of Lerwick School Board, a report, with relative sketch plans, was submitted by Mr. Wilson, Architect to the Edinburgh School Board, with reference to proposed enlargements of the present school accommodation in Lerwick. As requested by the Board, he submitted alternative plans. The meeting resolved to remit the plans to a committee for report.

NATIONAL SCHOOLS, LISSON GROVE.—New and enlarged National Schools in connexion with St. Paul's Church, Broadley-terrace, Lisson Grove, have just been dedicated and opened. The new buildings have been erected from plans prepared by Mr. A. J. Stenning, for the Great Central Railway Company, who have borne the expense of building, as compensation for the destruction of the old schools on account of the railway extension in the parish.

SCHOOLS, BOULTHAM, LINCOLNSHIRE.—New schools have been erected by the School Board for Boultham. They will accommodate 125 boys, the same number of girls, and about 70 infants. The contractors were Messrs. W. Wright & Son, and the architects, Messrs. Mortimer & Son, both of Lincoln.

REBUILDING OF HOTEL, BRAEMAR, SCOTLAND.—The Fife Arms Hotel, Braemar, Aberdeenshire, is to be rebuilt from designs by Mr. A. Marshall Mackenzie, Aberdeen. The work is to be done in sections, so as not to interrupt the tourist season. The first section, consisting of kitchen and work department, has now been commenced, and is expected to be ready for the visitors' season of 1898. Local granite will be used in the mason work, and the total expense is estimated at about 7,000*l.*

GIRLS' CLUB-HOUSE, PAISLEY.—The new building to be erected at Ferguslie by Messrs. J. & P. Coats is to be used as a club-house for girls employed in the Ferguslie Thread-Works. The building, which adjoins the works, will have frontages in Back Row and Ferguslie-street, the elevation to Ferguslie-street being two stories and attics, and that to Back Row is to have a basement and three stories and attics. In the basement flat are placed the kitchen, washing-house, laundry accommodation, and heating apparatus, whilst on the Ferguslie portion of the ground floor are the committee-room, matron's-room, cloak-room, &c. To the rear of these rooms there is to be a hall, lighted from the roof, with a dining-room and two reading-rooms in the Back Row portion of the building. A library and waiting-room are to be placed in the Ferguslie frontage, with the keeper's house in the attics, and the three floors in the Back Row elevation are to be devoted to dormitories, with two sitting-rooms, also on the first floor. Mr. T. Graham Abercromby, Paisley, is architect of the building.

OFFICES, COLEMAN-STREET, CITY.—A block of offices has been erected on the site of 30, 31, and 32, Coleman-street, and 1, Mason's-avenue. The approach to Mason's-avenue, running between Nos. 30 and 31, Coleman-street, has been increased in width, and the covered way has been reduced from 35 ft. to 22 ft. in length. The architects of the new building are Messrs. Gardner & Theobald.

OPERATING THEATRE, BOLTON INFIRMARY.—An addition has just been made to this building of a new operating theatre. The new theatre has been erected on the west side of the corridor leading to the children's wards, and opposite the opening between the male and children's blocks. The addition is in harmony with the architecture of the old structure, and is built of brick with stone string courses. Entrance to the theatre is gained through a 5 ft. doorway into a vestibule. The anæsthetising room (15 ft. by 13 ft.) is to the right of the vestibule, and is lighted from a window on the north side. The operating room is 30 ft. long by 23 ft. wide, with circular-end windows on the north, south, and west. The floor is carried on iron girders, concreted 8 in. thick, and finished with encaustic tiles. The walls are tiled with white and cream-coloured tiles. A door from the corridor opens into the honorary medical officer's cousulting room, and another door opens into the vestibule leading to the theatre. The new theatre has been designed, and the work supervised, by Mr. James Briscoe. The main contract has been let to Mr. John Roberts, builder, and the sub-contracts were as follow :—Ironwork, Mr. J. Booth ; slating, Messrs. Warr & Co. ; plumbing, Messrs. Vause & Son ; tiles, Messrs. Maw & Co. (Staffordshire) ; lavatory fittings, Messrs. Twyford & Co. ; radiators, Messrs. Newton, Chambers, & Co., Sheffield ; steam fittings, Messrs. Marsden & Co. ; and the electricity and gas fittings by the Bolton Corporation ; and sterilisers, Messrs. J. Baxendale & Son.

PAROCHIAL HALL, BOOTLE.—On the 12th inst. St. Matthew's Parochial Hall, Bootle, was opened by Miss Ryle. The hall stands on a site adjacent to the church. At present only a portion of the whole scheme has been carried out. This portion, however, provides the following accommodation :—A hall, capable of containing nearly 400 persons, is approached by a main entrance at the church end, and a subsidiary entrance at the other. To the left of the main entrance are the lavatories and a corridor connecting the hall with the church. The staircase from the entrance-hall leads to a balcony projected into the large hall, and to a young men's room on the first floor. The subsidiary entrance is in communication with a kitchen on the ground floor. There is also a young women's room on the first floor. The plans were prepared originally by Mr. Charles Aldridge, who, however, did not live to see the work commenced. Its prosecution was entrusted to his son, Mr. Ernest Aldridge, under the superintendence of Messrs. Willink & Thicknesse, of Liverpool. The contractors for the work were Messrs. George Woods & Son. The sub-contractors were Mr. Cothliffe for the plastering, and Mr. John Piercy for the gas-fitting.

ROYAL ARCADE, WEYMOUTH.—The Royal Arcade, leading from the Esplanade at Weymouth, is now completed. This building contains fourteen shops, with basements, lavatories, and rooms over, and is covered with an ornamental iron and glass roof, with front and back elevations of Bridgewater bricks and Portland and Corsham Down stone dressings. A band stand has been arranged at the east end of the Arcade. The ironwork has been carried out by Messrs. Walter Jones & Sons ; Messrs. Creaton & Co. were the builders, and the building was carried out under the superintendence and from the designs of Mr. C. Orlando Law, of London and Weymouth.

MOORGATE-STREET STATION.—The new superstructure of Moorgate-street Station, designed by Mr. Delissa Joseph, has now been completed at a cost of about 18,000*l.*, the contractors being Messrs. J. Allen & Sons. The elevation is executed in Portland stone, and occupies a frontage of about 155 ft. to Moorfields, and of about 90 ft. to Fore-street-avenue.

NORTH STAFFORDSHIRE INFIRMARY.—New operation rooms have just been opened in connexion with this building. The alterations have been carried out by Mr. T. Goodwin, builder, from the designs of Messrs. Lynam, Beckett, & Lynam, at an estimated cost of 1,000*l.*

CHURCH SPIRE, GREATHAM.—The new church spire which has been added to this edifice was recently dedicated by the Bishop of Winchester. The new spire represents an addition of about 70 ft. to the tower, at the eastern end of the church. The spire is of English oak covered with oak boardings and shingles, and a weather vane crowns the whole. It is protected by a lightning conductor. The two bells in the tower have been rehung. Messrs. J. H. & E. Dyer, of Alton, have carried out these works from plans prepared by Mr. F. Chancellor, of London and Chelmsford.

GIRLS' HOME, NEWPORT.—This new building, which has been erected on the side of the highway leading to Edgmond from Newport, was opened by the Bishop of Shrewsbury recently. The new building is called the "Edgmond Certified Girls' Home." Messrs. Veall (Wolverhampton) were the architects, and Mr. Whittingham (Newport) the builder.

INSTITUTE, LYTHAM, LANCASHIRE.—The foundation stone has just been laid of the new wing of the Lytham Institute. Mr. Grimble is the architect for the new wing. The estimated cost is 1,500*l.*

VICTORIA INSTITUTE, MISTERTON, NOTTINGHAM.—This building has been erected in commemoration of the Diamond Jubilee. The architect was Mr. T. C. Massey, of Alderley Edge, and the work has been carried out by Mr. Moody, of West Stockwith, and Messrs. Smith & Chambers, of Misterton.

CLUB BUILDINGS, CREWE.—On the 15th inst. the club erected by the Liberal Unionists of Crewe was opened by Lord Arthur Grosvenor. The club is situated at the corner of Edleston-road and Myrtle-street, and is of red Ruabon brick and terra-cotta. The design was prepared by Mr. Joseph Cawley, of Northwich, and is in the English Renaissance style.

TALL TOWER, NEW BRIGHTON.—The New Brighton Tower has now been finished. In shape it is octagonal, standing on eight legs, the base being 150 ft. across. It is constructed of steel. Messrs. Maxwell & Tuke, architects and engineers, of Manchester, designed the structure, and the work of erection has been in the hands of Messrs. Handyside, of Derby, with Mr. John Ashley as clerk of the works. The lower portion of the structure is hidden by a block of buildings, now approaching completion, and 90 ft. high from the ground. In this block will be a theatre for stage plays, with seating accommodation for 3,000 persons ; above that a concert and ball room with a parquet floor laid upon springs, with promenade and outside balconies ; and on the third floor is to be winter gardens, covered in with a glass dome roof. Visitors may reach the various floors in this building by any of four staircases leading from the two main entrances on the ground floor, or the ascent may be made in one of the four elevators provided. It is from the winter gardens at the top of the main buildings that visitors will commence the actual ascent of the tower. There is a staircase leading up inside the tower, but this is devoted to the use of workmen only, and for visitors there are available four elevators. Each of these elevators will carry thirty persons. All the lifts will be worked by electrical power. The tower lifts will not convey visitors to the actual summit, their landing platform being a floor 56 ft. across, at a height of 394 ft. from the ground. This platform is closed in, but a higher point can be reached by a staircase. Twenty feet above the landing platform is a floor provided with an outer balcony, and 6 ft. higher there is another open platform. Above this again are two other

platforms, and then, by passing up a staircase through the inside of a dome of copper, access is gained to the Crow's Nest, 513 ft. from the earth below.

NEW INFIRMARY PAVILION, HACKNEY. — On Tuesday an extension of the Infirmary, High-street, Homerton, was opened by the Rev. Prebendary Shelford, Chairman of the Infirmary Committee. The new building, which will be known as Pavilion A, is situated at the corner of Sidney-road and High-street, Homerton. The new structure, which has been erected from the designs and under the supervision of the board's architect, Mr. W. A. Finch, is of brick. Iron galleries give immediate access to the open air from each of the upper floors. The basement is fitted for the reception of stores, and the three floors above will accommodate 228 patients. The floors are of polished oak, and each ward is 12 ft. from floor to ceiling. The baths and lavatories are in separate turrets connected with the wards by bridges. Access to the upper floors is obtained by means of a lift sufficiently large to contain a bed and attendants, also by a staircase in a turret connected with the building by bridges only. The wards are heated with hot water pipes and central stoves with descending flues, and the walls of the corridors and offices are faced with white glazed bricks. Some of the rooms vacated will be altered for temporary administrative purposes, pending the erection of new administrative buildings. The new pavilion has been buil by Mr. S. R. Lamble, of Kentish Town, the cost of the pavilion being 33,000*l.*

NEW BUILDINGS, FORRES.—The building boom in Forres was initiated by the Forres Building Company on the Sanquhar lands. The offices at the mansion house of Sanquhar have been overhauled and extended, Forres tradesmen having for a year past been employed in building and other operations. A start has now been made with the erection of a bungalow on an elevated knoll overlooking the garden. It is intended as a residence for the gardener and his employés. On other parts of Sanquhar Mr. Edward, the proprietor, is erecting cottages for farm workers and ploughmen, each building being adapted for two families, both having a kitchen, scullery, and two bedrooms. All the plans are by Mr. P. Fulton, architect, Forres, and the work is being carried out under his superintendence.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, WHITBY DISTRICT.—The Whitby Rural District Council instructed Messrs. D. Balfour & Son, civil engineers, Newcastle, to report on a scheme of water supply for the township of Fylingdales, in their district, including Robin Hood's Bay Thorpe, and Thorpe Lane. The engineers' recommendations have been adopted by the Council - At Park Gate it is proposed to construct a service reservoir with a capacity of 200,000 gallons. The water will then be distributed over the township in cast-iron mains, with the necessary valves and other appurtenances.

LOCKS FOR THE THAMES.—A conference of representatives of riparian authorities on the Thames, between Isleworth and Fulham, took place on the 14th inst. at the Hammersmith Town Hall, to consider a new report from Mr. E. Pritchard, engineer, with regard to the construction of a lock on the lower Thames. At the last conference, held three months ago, Mr. Pritchard reported upon a scheme for a lock at Broomhouse Dock, midway between Putney and Wandsworth Bridges, which he recommended should be constructed at a cost of 280,000*l.* He was then requested to report with regard to a site at the foot of York-place, Battersea, mid-way between Wandsworth Bridge and the West London Extension railway bridge. He now reported that this site was much superior and more suitable, and that locks and sluices could be constructed there for 220,000*l.*, the river here being narrower. A conditional approval was unanimously given to the new scheme, and it was referred to the constituent bodies for consideration.

PORTLAND HARBOUR.—The tender of Messrs. Woodman, Hill, & Co., of Gosport, has been accepted by the Admiralty for carrying out work in connexion with the defence of Portland Harbour against torpedo attack in time of war. To enclose and securely safeguard the harbour will cost about 650,000*l.*, and the work will not be completed until about March, 1901.

PIER, MENAI BRIDGE.—Mr. F. H. Tulloch opened an inquiry at Menai Bridge on the 14th inst. respecting an application made to the Board of Trade by the Urban District Council to grant a provisional order for the erection of a pier and pavilion and other works. Mr. Webster, C.E., the engineer of the scheme, explained that unless the Board of Trade should direct otherwise, the pier would extend seawards in a southerly direction for a distance of 320 ft. or thereabouts, commencing at a point at the east end of St. George's-road. He estimated the cost at 3,000*l.*, inclusive of the erection of a warehouse and waiting room. On the existing piers there was no accommodation for visitors.

DRAINAGE, HUNGERFORD. — The Rural District Council, at their last meeting, accepted the scheme of drainage and sewage disposal submitted by Mr. E. W. Ives, C.E., of Derby, and it was resolved to apply to the Local Government Board for sanction to borrow 4,000*l.* to carry out the scheme.

BIGGLESWADE MAIN DRAINAGE.—At a meeting of the Biggleswade Urban District Council, held at the Town Hall, on the 19th inst., the sewerage scheme (broad irrigation) of their Engineer, Mr, John W. B. Rooke, was approved of, and a further honorarium of 150 guineas was voted. The estimated cost of the scheme (exclusive of irrigation land, 40 acres in extent) amounts to 16,000*l.*

STAINED GLASS AND DECORATION.

WINDOWS, INVERNESS COUNCIL CHAMBERS.—A memorial in commemoration of the Diamond Jubilee year of her Majesty, taking the form of stained glass windows, has just been erected by the Provost and Council of Inverness in the Council Chambers. The centre window represents her Majesty in her robes of State, bearing in her hands the Imperial symbols. Underneath the figure is placed the memorial inscription tablet. The upper part of this window, which is circular in form, is filled with the Royal Arms. In the side windows are portrayed all the Prime Ministers who have held office from the time her Majesty ascended the throne till the present day. The small panels at the base represent commerce and the Forth Bridge. The circular spans above these lights are filled with panels of the Arms of Scotland. The window was designed by Mr. J. T. Stewart, chief artist with the firm of William Meikle & Sons, who are responsible for the carrying out of the work.

MEMORIAL WINDOW, ALDERMASTON CHURCH, BERKS.—A stained-glass window has recently been placed on the north side of the nave of Aldermaston Church, as a memorial to the late Mr. Higford Burr. The work was entrusted to Mr. Philip H. Newman.

WINDOW, ST. CLEER CHURCH, CORNWALL. —The north-west window of St. Cleer Church has been filled with painted glass in memory of the late Mrs. Newson. The three lights each contain a single figure, that on the left representing Faith, the central figure Charity, and that on the right Hope. On behalf of Messrs. Lavers & Westlake, of London, who executed the work, Messrs. J. Sweet & Sons, of Liskeard, completed the fixing of the glass in its stone framework, which has been restored.

ST. JAMES' CHURCH MEMORIAL WINDOW, EDINBURGH.—In St. James' Parish Church, Carson-street, Edinburgh, on the 15th inst., the Rev. Dr. Cameron Lees unveiled a stained-glass window erected to the memory of the late Helen Gordon. The window was supplied by Messrs. Jones & Willis, London.

FOREIGN.

FRANCE.—A new asylum for aged men has been founded at Plassy. M. Vaudremer is the architect. ——The celebrated Café Riche, on the Boulevard des Italiens, rebuilt regardless of expense four years ago from the designs of M. Albert Ballu, is now being pulled down. It possessed a quantity of polychromatic decoration in very poor taste. On the exterior was a series of hunting scenes designed by the caricaturist Forain, and reproduced in ceramic by M. Leibnitz. Various ceilings in the building were also painted by well-known artists, M. Felix Barrias in particular.——M. Allain, Inspecteur in the Paris Department of Architecture, has been appointed architect to the Fourth Section of Paris, in place of M. Menjor de Dammartin, who retires.——M. Bonnat has been appointed President of the Société des Artistes Français, and MM. Loviot and Fremiet Vice-Presidents. M. Jean Paul Laurens is President of the jury of painting for 1898; M. Barrias, of the jury of sculpture; and M. Ginain, of the jury of architecture.——The first stone has just been formally laid of the new hippodrome in Paris, at the angle of the Boulevard du Clichy and the Pont Caulaincourt.——The mean houses abutting against the ancient church of St. Julien le Pauvre are to be pulled down.——Three small pictures by Ingres have been found in the stores of the Louvre, and have been placed in one of the Galleries. They are reductions of the "Venus Anadyomene" and "La Source," and a sketch for an Apotheosis of Napoléon.—— The question of purchasing the Hôtel de Sens, and transforming it into a museum, is again before the Paris Municipal authorities.——M. Falguière has just completed the statue of Cardinal Lavigerie, which will be cast in bronze and erected in Algeria. ——It is announced that the Prince of Wales is to preside on the occasion of the laying of the first stone for the new pier at Cannes in March next. ——The jury in the Competition at Evreux for a new municipal theatre have awarded the first premium to M. Léon Legendre, the second to M. Ernest Charpentier, and the third to MM. Delaunay and Gossart.——M. Dubois has been elected President of the Architectural Society of Anjou for 1898.——The death is announced, at the age of sixty-nine, of the painter Charles Houry, a native of Belgium but naturalised as a Frenchman, and one of the founders of the Société des Artistes Français. He was a pupil of Léon Cogniet and of the École des Beaux-Arts. Among his principal works may be named "La Mort de Charles Téméraire" (Salon of 1852), the "Dernières Moments de Marie de Medicis" (Salon of 1857), "L'Heure du Piano" (Salon of 1880), and some interesting works in terra-cotta faïence, one of which "Le Printemps," is in the Luxembourg Museum.——The Institut de France has decided that the collections of Chantilly, which will bear the name of "Musée Condé," will be open to the public on Sundays and Thursdays from 1 to 5 p.m., from April 15 to October 15. The parks and gardens will be open on Sundays and Thursdays during the whole year, as well as on public holidays; from 1 to 6 p.m. in summer and from 1 to 4 p.m. in winter.

GERMANY.—A very important competition has just been decided at Wiesbaden, where some premiums were offered for the design of a *kurhaus* or large assembly-room. An influential jury of assessors had been selected, including Dr. Wallot. The first premium of 300*l.* was awarded to A. Menz, of Bremen. There was a second premium of 200*l.*, several of 100*l.*, and there were also a number of minor awards.——Of other competitions we notice one for a new Museum for Magdeburg.——Bromberg is to have a large city park. It has been presented to the town by the Government. —— We regret to record the death of Herr Wunder, one of the City Councillors of Berlin, whose wonderful collection of drawings and prints relating to the German capital had more than local interest. A number of drawings by Schinkel, in his collection, were well known to architects. —— We regret further to record the death of Baurath Sager, who has so long been associated with the large public works of Germany. In reality he might be termed a contractor, though he held an official position to the Bavarian Government. Perhaps "official master builder" would be a right definition of his position. At all events, he contracted for many important railways, for a section of the Baltic Canal, and also for some important improvements in Vienna.——The rearrangement of the large site occupied by the Royal Academy will now probably soon be taken in hand, and is receiving considerable attention. As matters stand at present there is some probability of carrying out a large improvement scheme in connexion with the matter, and appropriating much of the ground now occupied by the Royal stables at the back of the Academy for a new National Library. The present library buildings, though of historical interest, are quite unsuited to their purpose.

MISCELLANEOUS.

WILL OF THE LATE MR. J. L. PEARSON, R.A.— By the will bearing date July 6, 1873, of Mr. John Loughborough Pearson, who died on December 11, he leaves personal estate of the value of 51,943*l.* 10s. 10d. The sole executor of his will is his son Mr. Frank Loughborough Pearson.

PROPOSED DUNDEE BUILDING TRADE ASSOCIATION.—A movement is on foot, it is stated, for the formation of an Association, to be called the Dundee and District Builders' and Quarrymasters' Association, and organised on the same lines as a similar body in Aberdeen. According to a provisional constitution which has been drafted, it is proposed that the Association should consist of employers belonging to the building and quarrying trades in Dundee and district, and its objects are stated to be the consideration of the state of trade, the rise and fall of wages, regulation of trade prices, and mutual co-operation.

TEES-SIDE MASTER BUILDERS.—On the 12th inst., the first annual general meeting of the Tees-Side and District Master Builders' Association was held in the Masonic Hall, Stockton, Mr. John Davison (President) in the chair. The Secretary (Mr. W. C. Creasor) read the first annual report, in which the committee stated they had to congratulate the members on the success attending their efforts. At a meeting held at Stockton on February 17, 1897, convened by Mr. Dickenson, of Middlesbrough, when representatives from the local associations at Stockton, Darlington, Middlesbrough, and the Hartlepools attended, it was decided to form a Tees-side and District Master Builders' Association, having for its principal objects the protection of members' interests, the securing of an equitable contract agreement applicable to the whole district; the securing of arbitration in case of disputes, and the supplying and guaranteeing of quantities. In pursuance of these objects a circular was issued in May last to all the architects in the district asking for their opinion on such matters as the supplying and guaranteeing of quantities, the allowance of provisional sums, joint fire insurances, mode of payments, and arbitration. With one or two exceptions, the whole of the architects thus addressed replied to the circular. The Committee gave careful consideration to those replies (the majority of which were favourable to the Association), and, as the result, issued another circular in September, stating that members of the Association would not tender for work without quantities being supplied and guaranteed on all contracts costing over 400*l.* The result of that had been that quantities had been supplied and guaranteed in many cases where such a thing would not have been thought of had it not been for that action. They had, in the last few weeks, sent out another circular, asking that an arbitration clause should be inserted in all future contract agreements, and it was hoped that the members would uphold that principle, as it

was manifestly unfair that the person who ordered and controlled the work should be sole judge in cases of dispute. They noted with pleasure the satisfactory state of the building trade during the past year. Work had been fairly plentiful, and disputes few. This report was unanimously adopted. The following officers were then elected for the ensuing year :—President, Mr. J. Davison ; vice-president, Mr. Dickenson ; hon. treasurer, Mr. Burn ; secretary, Mr. W. C. Creaser.—A dinner was subsequently held, Mr. John Davison presiding. Mr. J.M.Bottomley, in proposing "The Tees-side and District Master Builders' Association," said after twenty years and upwards of experience as an architect in that district he knew that such an association had been long required, not only for their own interests, but for the interests of those for whom they were all working, and whom they all served. The chairman and the vice-chairman responded. Other toasts followed.

CITY OF LONDON CORPORATION LEASES.—The City Lands Committee have framed a report upon renewable leases of the City's property. A scheme adopted by the Corporation in 1888 enabled lessees (in perpetuity) to commute the fines payable by them in future, and many availed themselves of the opportunity. Lessees on the Conduit Mead Estate were offered a choice of two modes : by one mode they could take an eighty years' lease, renewable in perpetuity, on payment of the present value of all future fines calculated on a 3 per cent. table *plus* one year's rack-rent ; by the other mode they could take a similar lease on paying an increased annual rental equivalent to the present value of future fines and one year's rack-rent calculated at 3 per cent. The Committee recommend that, in view of the low rate of interest on investments which now obtains, the 2½ per cent. table should, in fairness and reason, be adopted instead of the 3 per cent. table for the former, though not for the latter, alternative.

EARTHQUAKES AND BUILDINGS.—In *Nature* for the 13th inst., Professor Milne commences a serial article on "Recent Seismology," which includes some remarks on the influence of earthquakes on buildings. The attention of builders in Japan has been drawn to the fact that the movement is greatest on that side of a building where the ground is softest, and also (which is more important, in regard to the question of foundations) that at a depth of 10 or 20 feet the movements of the ground were found to be less than at the surface.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE : ARCHITECTURAL CRAFTSMEN'S SOCIETY.—A paper, under the auspices of the Architectural Craftsmen's Society, and entitled "Roman and Etruscan Architecture," was delivered recently by Mr. D. Bennett Dobson.

MANCHESTER MUNICIPAL SCHOOL OF ART.—The committee of the Municipal School of Art have arranged for a course of ten lectures on Classic Architecture to be given by Mr. Hugh Stannus. The lectures will deal with the characteristic features of classical architecture. Each lecture after the first will be preceded by an examination of the work done by the students, and be followed by a conversation upon the subject matter of the lecture. The lectures are especially addressed to those engaged in the study and practice of architecture in the city and district. The first lecture of the course was delivered in the School of Art, Cavendish-street, on the 13th inst. Mr. William Burton, F.C.S., has also accepted the invitation of the committee to deliver a course of four lectures in the City Art Gallery, Mosley-street, on "Material and Design in Pottery," beginning Tuesday, Feb. 1. The lectures will deal with simple earthenwares, faïence, and fine earthenwares, stone wares and porcelains of all periods and countries. The lectures are free to the public.

PUBLIC IMPROVEMENTS, READING.—Colonel J. T. Marsh, R.E., one of the Inspectors of the Local Government Board, held a local enquiry at the Council Chamber, Reading, recently into the subject matter of a petition from the Corporation for a provisional order to empower them to compulsorily purchase certain properties needed for the widening of East Forbury-road ; and also of an application from the Council for sanction to borrow 5,000*l.* for purposes of public walks and pleasure grounds, 4,050*l.* for purposes of street improvement, and 1,650*l.* for stables and two houses at their depôt in the Caversham-road.

COMPOSITION IN ARCHITECTURAL STUDIES.—A meeting of the Edinburgh Photographic Society was held in the hall of the Society on the 12th inst., when Mr. H. J. Blanc, R.S.A., one of the honorary Presidents, contributed a paper on "Composition in Architectural Studies." At the outset Mr. Blanc suggested a definition of composition to show the different conditions under which composition has to be considered by the painter, the sculptor, and the architect. The painter worked upon a surface of canvas, which he could alter and treat according to his will, but which, when done, did not change. The sculptor did his work, like the architect, in his studio, but when brought out to the light of day and put in position, not one aspect of it only was viewed, but it was surveyed from all sides, and therefore, he said, the architect and the sculptor had to make their compositions pleasing from many points of view. He pointed out that the photographer of architectural studies was under the same disadvantage in that the group photographer could pose his subject in front of his camera, but the architectural photographer had to bring his camera round and round his building or group of buildings until he found out the best position from which he could obtain the most satisfactory picture. In this connexion, Mr. Blanc spoke of the great advantages a city like Edinburgh possessed for this branch of photography on account of its openness and the facilities it enjoyed for viewing architecture at a reasonable distance. He concluded with some hints as to the study of architectural work, according to the situation and according to the period of the year and the time of the day, so as to avoid getting either a weak and flat picture or one whose shadows overmassed the leading features of the design.

NEW ORGAN, COTHAM WESLEYAN CHAPEL.—On Saturday, last week, the new organ at Cotham Wesleyan Chapel was opened. The instrument was constructed by Mr. W. G. Vowles. The case of the organ was designed by the architects of the building, Messrs. Curwen & Jones, and the work has been carried out by Messrs. Stephens & Bastow.

CAPITAL AND LABOUR.

BOLTON PLASTERERS AND THEIR WAGES.—The plasterers of Bolton have just sent in an application for an advance in their wages from 9d. to 10d. per hour, and a request to be allowed to start work half an hour later each summer morning except Monday.

MANCHESTER PAINTERS AND THEIR WAGES.—As the result of an application by the members of the house painters' trades-union in the Manchester district for an increase of wages, it has been agreed by the employers to make an advance of one halfpenny per hour above the present rate, to date from next May.

MORECAMBE JOINERS' DISPUTE.—On September 1 last the Morecambe joiners gave notice for an advance in wages from 7¼d. to 8d. per hour ; and for an alteration in rules to include double time on Saturday afternoon and Sunday. No action was taken by the masters until recently, when the secretary of the Carpenters and Builders' Society (Mr. John Isaacs) had an interview with Mr. Joseph Willis, who acted as secretary for the masters two years ago. Mr. Willis called a meeting of the masters, and it was decided not to take action until they heard further from the men. A meeting of the masters was held, and they decided to offer the men ¼d. per hour advance, no alteration of the rules, but this was not accepted. Subsequently a conference was held, at which both masters and men were represented, and the latter agreed to accept 8d. per hour without alteration of rules, or 7¾d. with the alterations. The masters would not agree to this, but offered 7¾d. an hour, with no alteration of rules. The men would not agree to this, and decided to bring their tools out of their respective shops on New Year's Eve. The masters adhered to their decision, and all the joiners in the town came out. Meetings of the men and masters were subsequently held, and the masters eventually agreed to give 7¾d. an hour up to January 1 next, and a ¼d. per hour increase after that day, and to reinstate the men. This offer was accepted by the men, who resumed work.

THE PLASTERERS' STRIKE, LIVERPOOL.—The Lord Mayor (Alderman John Houlding) having consented, at the request of both masters and employees, to act as arbitrator in the dispute in the plastering trade in Liverpool, sat at the Town Hall on the 13th inst. to hear evidence on the points contested. The Liverpool Master Builders' Association was represented by Messrs. Thomas Jones, Charles Tanner, Ben. H. Johnson, Robert Johnson, R. Bromley Gardner, J. Cothliffe, and J. A. S. Hassal (secretary); and for the National Association of Operative Plasterers there appeared Messrs. W. W. Jackson, J. Griffin, W. Morgan, Richard King, J. Crute, John Kenny, and W. Baldwin, (secretary). The arbitrator sat for nearly two hours, evidence being submitted by both sides on the apprentice rule, country rule, and the time for giving notice of alteration in rules. These points were fully dealt with, and his Lordship intimated that he would give his award at as early a date as possible.

LEGAL.

THE CLAIM AGAINST THE ST. PANCRAS GUARDIANS.

MR. JUSTICE RIDLEY in the Queen's Bench division, on the 14th inst. resumed the hearing of the case of Drew-Bear & Co. and Others *v.* the Guardians of the Poor of St. Pancras for the assessment of the damages to be paid by the defendants to the plaintiffs in respect of certain breaches of contract found by the Court of Appeal in connexion with the building of the St. Pancras Workhouse.

The case has been fully reported in the following issues of the *Builder*, viz. : November 21 and 28 and December 5, 1896, January 23 and 30, March 6 and 13, April 17, May 22, November 6, 1897, and January 15, 1898.

Mr. R. M. Bray, Q.C., and Mr. A. A. Hudson appeared as counsel for the plaintiffs, and Mr. English Harrison, Q.C., and Mr. Wm. Moyses for the defendants, the Guardians.

Mr. Wm. Henry Thurgood, a surveyor, of Great George-street, and a Fellow of the Surveyors' Institution, examined, said he had been in practice for eighteen years as a surveyor, and previously to that was a builder in a large way for many years. He was called in in April, 1893, to measure up the work for the trustees, and he had some knowledge of the work as it was going on. He considered the charge made for loss owing to the plaintiffs obtaining piecemeal possession was a fair one, having regard to the increased expense caused thereby. He should consider the extra expense under that head at 12½ per cent. on the contract price, at least.

Cross-examined by Mr. English Harrison : He arrived at the 12½ per cent. from his knowledge and experience of the work carried out.

Mr. H. W. D. Theobald, surveyor, of Great Russell-street, examined, said he acted as surveyor to the Office of Works at the War Department occasionally, and he was the arbitrator who was chosen by Kirk & Randall and the Guardians in respect of the dispute between them. He thought that 12½ per cent would be a fair allowance for the contractors in respect of the delay in getting possession and for interference in the roads.

Cross-examined : Interference in the roads was caused by ambulances and coal trucks going backwards and forwards to the workhouse.

Mr. W. H. Strudwick, a surveyor practising in New Inn chambers and a Fellow of the Surveyors' Institution, examined, said that he had been a surveyor for thirty-five years, and he corroborated the evidence of the last witness that 12½ per cent. was a fair price to charge.

In the course of evidence for the Guardians,

Mr. A. Boden said he was Chairman of the Building Committee of the Board of Guardians at the time the work in question was carried out, and he saw from time to time all the works during their execution. From first to last during the execution of the work, Mr. Fearon did not apply to him to be allowed to make an entrance between block H and the end of block A.

His Lordship : This is a matter for the architect clearly.

Mr. Harrison : If it was a matter for the architect I could deal with it.

His Lordship : The architect gave him one entrance instead of the other.

In reply to Mr. Harrison the witness said he never at any time gave an order to Mr. Fearon to repair either of the two roads. Mr. Fearon never complained to him that the roads were being used by the Guardians.

Mr. A. Millward, Clerk to the Guardians, said he never gave orders for repair of the two roads. He never allowed any traffic of the Guardians to pass over those two roads, and it was contrary to his regulations if traffic did pass over them

Captain Thomas Miller, the Master of the Workhouse, said no traffic of the Guardians passed over either of the two roads mentioned whilst the work was being carried on.

Mr. J. G. Deane, examined, said he acted as gate-gatekeeper of the workhouse during the whole of the period of the execution of the works. He kept a book recording all entrances of carts and vans coming in at the gate. No vehicles on the Vestry's business came in. Heavy traffic was unloaded at the Commercial-street entrance, and the lighter traffic at the Receiving Ward. His lodge was close to the Vestry Hall, and his duty was to remain at his post all day. He did not remember Mr. Fearon calling his attention to carts coming in at the Vestry entrance.

Mr. Wm. A. McCormick, examined, said he was a builder in the Essex-road, and from his books he found there was no appreciable rise in the price of building materials.

His Lordship : The suggestion is that the rise was in 1892.

Mr. Harrison said he thought the evidence was rather the other way. Bricks and timber were the chief things.

Further examined, the witness said he had examined the invoices in his business for the purpose of seeing whether there was a rise in bricks and timber in 1892. At the end of 1892 he could not detect anything appreciable, but since 1895 there had been large strides.

This being the close of the evidence, Mr. English Harrison addressed his lordship on behalf of the Guardians, and Mr. Bray replied on behalf of the plaintiffs.

His Lordship, at the conclusion of the arguments, said he would take a few days to consider the matter, and would give notice as to when he would be able to give his decision.

Judgment was reserved accordingly.

ACTION AGAINST BUILDERS ON A LEGAL GUARANTEE.

THE case of Vigers *v.* Cobbett & Co. came before Mr. Justice Bruce in the Queen's Bench division on the 15th inst., it being an action on a guarantee given by the defendants, a firm of builders and contractors, for payment of timber supplied to a builder named Cox who was doing work for the defendants. The case depended solely upon whether an order given by the plaintiff to the defendants, authorizing them to collect the timber from a general stock belonging to the plaintiff and

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Stable and Coach House, Lightcliffe, near Halifax	.....	J. F. Walsh, Archt. Lay Bank-chmbrs. Halifax	Jan. 25
Sixteen Houses off Cardigan-lane, Burley, Yorks	.....	E. F. Wilkinson, Archt. 35, Park-sq. Leeds	do.
Rebuilding Business Premises, High street, Bideford	.....	R. T. Hookway, Archt. 12, Bridgeland-st. Bideford	do.
Steel Girder Bridge over River Bann, near Laurencetown	G.N.Ry Co. (Ireland)	District Engineer, Belfast	do.
Inn, Elton, Darlington	J. W. Cameron & Co.	E. A. Whipham, Archt 59, High-st. Stockton-on-Tees	do.
Eight Houses, George-street, Batley, Yorks	.....	B. Watson, Archt. Bradford-road, Batley	do.
Iron Pipes	Bury (Lancs.) Corp.	T. Rigby, Parson's-lane, Bury	do.
Water Main, Bolton-st. Rambottom	do.	do.	do.
*Stoneware Pipe Sewers	Tottenham U.D.C.	P. E Murphy, Engr. 412, High-road, Tottenham	do.
*Oak Fencing	County Borough of West Ham	Mr. Lewis Angell, Town Hall, Stratford, E.	do.
*Annual Contracts	Willesden D.C.	O. Claude Robson, Engr. Public Offices	do.
House, Lamb-street	Walker (Northd.) Co-op. Soc. Ltd.	Secy. Society's Offices, Walker	do.
Additions to Brook Cottage, Windermere	.....	R. Walker, Archt. Windermere	Jan. 26
Plumbing, Painting, &c. Aviemore Junction, N.B.	Highland Ry. Co.	W. Roberts, Engr. Inverness	do.
Five Houses, Thornhill-rd. Dewsbury	.....	J. H. Bressley, Archt. Hanover-st. Batley	do.
Alterations, Police Station	Middlesbrough Corp.	F. Baker, Boro Engr. Municipal Buildings	do.
Widening Plymouth-road	Buckfastleigh (Devon) U.D.C.	J. Willcocks, Surv. Council's Offices	do.
Two Shops and Houses, Cooke-street, Keighley	.....	W. & J. B. Bailey, Archt. 1, Scott-st. Keighley	do.
Offices	Kingston-on-Hull Sch. Board	W. Botterill, Archt. 23, Parliament-st. Hull	do.
Sewering, &c. Winifred-road	Stockport Corp.	J. Atkinson, C.E 8t Petersgate, Stockport	do.
House, &c Clifton, nr. Lancaster	.....	C. Leeson, Caton	do.
Sewerage Works, Manchester Old-road, &c.	Middleton (Lancs.) Corporation	H. L. Hinnell, C.E. 41, Corporation-st. Manchester	do.
Sewer, &c. Spencer-road	Normanton U.D.C.	C. L. B. Fernandes, Council's Offices	do.
Rebuilding, &c. Schools, Hume-street	Kidderminster Sch. Board	J. T. Meredith, Archt. Bank Buildings	Jan. 27
Shops, Paradise-road, King's Lynn	A. Jermyn	W. Jarvis, Archt. Market-square, King's Lynn	do.
Pipe Laying (3,000 yards)	Burgh of North Berwick Police Commrs.	Leslie & Reid, C.E. 72A, George-st. Edinburgh	do.
Private Street Works, Clay-st. &c.	Turton (Lancs.) U.D.C.	V. W. Laithwaite, Surv. Public Offices, Bromley Cross, near Bolton	do.
Road Works, Bridge-street, West	Middlesbrough Corp.	F. Baker, C.E. Municipal Buildings	do.
*Road Making and Paving	Middleton Building Estate Owners	Walton & Lee, Surv. 10, Mount-st. Grosvenor-sq.	do.
*New Workhouse	Stockport Union	W. H. Ward, Paradise-st. Birmingham	do.
Additions to Stores, Bartholomew-street, Newbury	Messrs. Walker	S. Johns, Archt. Wallingford	do.
Additions to Bank Premises, Morecambe	Bank of Liverpool Ltd.	J. Marshall, Archt. Back-crescent, Morecambe	Jan. 28
Forty-eight Houses, Birchcliffe Estate, Hebden Bridge, Yorks	.....	Sutcliffe & Sutcliffe, Archt. Todmorden	do.
Flagging, &c. Cottingham-road	Hull Corporation	A. E. White, Engr. Town Hall, Hull	do.
Two Houses, East Ardsley, near Wakefield	A. Longley	Buttery & Birds, Archt. Queen-st. Morley	do.
Road Materials	Horncastle (Lincs.), R.D.C.	J. E. Chatterton, Council's Offices	do.
*Broken Granite	Norfolk County Council	T. H. B. Heslop, The Shirehouse, Norwich	Jan. 29
Nine Houses, College-road, Cork	J. Kelleher	W. H. Hill & Son, Archt. 28, South-mall, Cork	do.
Schools, Mount Zion, Pudsey, Yorks	.....	Hodgson & Farrar, Archt. Bank Chmbrs. Pudsey	do.
Making-up Gresham-road, Shenfield	Billericay (Essex) R.D.C.	J. Young, Guildford Lodge, Brentwood	do.
Street Works, Kilmorey-road	Hoole (Chester) U.D.C.	A. E. Caldecutt, 17, New-gate-st. Chester	do.
Street Works, Loughborough, Leics.	E. H. Warner	Woolley & Holbeche, Surv. Rectory-pl. Loughborough	do.
Bakery, Stables, &c. Fountain-street, Morley, Yorks	Metcalfe & Bradshaw	Buttery & Birds, Archt. Morley	do.
*Stoneware Sewer, Manholes, &c. Sewering, Levelling, Paving, &c. Roads	Hornsey U.D.C.	E J. Lovegrove, Council Offices, Southwood-lane, Highgate, N.	Jan. 31
*Electric Light Wiring and Fittings	St. Marylebone Gds.	A. Saxon Snell, 22, Southampton-bldgs. Chancery-lane, W.C.	do.
*Underground Transformer Substation	Shoreditch Vestry	Kincaid, Waller & Manville 29, Gt. George-st S.W.	do.
Additions to School, nr. Derby	Clowne Sch. Bd.	Robinson & Son, Archt. 13, Corporation-st. Chesterfield	do.
Pair Villas, Mardyke, Cork	.....	W. H. Hill & Son, Archt. 28, South-mall, Cork	do.
Covering in Portion of Wardie Burn	Edinburgh Corp.	Burgh Engineer, 1, Parliament-sq. Edinburgh	do.
Six Shops 15 Houses, &c. Kirkcaldy, N.B.	The Whytehouse Estate Co. Ltd.	R. Little, Archt. 4, St. Brycedale-av. Kirkcaldy	do.
Filtering Tanks, &c. New Bracepeth Colliery, Durham	Brandon, &c. U.D.C.	R. Gardner, Surv. Langley Moor, co. Durham	do.
Sewers &c. (8,000 yards)	Keighley R.D.C.	Barber & Co. Engr. Keighley	do.
Sewers (3½ miles)	Macclesfield R.D.C.	J. Thorpe, Surv. 19, King Edward-street	do.
Main Drain, Providence-terrace, Pontewain, Newport, Mon.	Provident Assoc. London, Ltd.	T. Cadogen, 17, Provident-terrace, Pontywain	do.
*Wood Paving of Suspension Bridge	Town of Inverness	Burgh Surv. Inverness	do.
Steward's House, &c.	Glasgow Corp.	City Engr. 64, Cochrane-street	Feb. 1
Church, Tullyallen, near Mellifont	Rev. T. Taffe	W. H. Byrne, Archt. 20, Suffolk-street, Dublin	do.
Disinfector Buildings, Sheds, &c.	Waterloo-with-Seaforth U.D.C.	F. S. Yates, C.E. Town Hall, Waterloo, Lancs.	do.
Pipe Sewers (2 miles)	King's Lynn Corp.	E. J. Silcock, C.E. Boro. Engr.	do.
Road-making, West Bromwich-road	Walsall Corp.	Boro. Surv. Bridge-street	do.
Cattle Market, Bourne, Lincs.	Warwick & Richardsons, Ltd.	F. G. Shilcock, Archt. West-street, Bourne	do.
34 Cottages, Malton-street, &c.	Manchester Corp.	City Surv. Town Hall	do.
26 Cottages, Junction-street, &c. Miles Platting	do.	do.	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*Thirteen Dwelling Houses, Isle of Grain, Kent	Admiralty	Coastguard Station, Yantlett Creek	Feb. 1
*Erection of Purifying House	King's Lynn Gas Co.	E. G. Smithard, Gas Works, King's Lynn	do.
Buildings at Gas Works	Paignton (Devon) Gas Co.	C. G. Dawson, Gas Works, Paignton	do.
Aqueduct (5 miles), Tal'a	Edinburgh Water Trust	Leslie & Reid, C.E. 72A, George-st. Edinburgh	Feb. 2
*Cast Iron Pipes, Hydrants, Valves, &c.	Ryde (I. of W.) Corp.	Boro Surv. Town Hall, Ryde	do.
*Pipe Sewers, Pump Well, Filtration Works, Manholes, &c.	Pontefract R.D.C.	J. Richardson, 5, Central Bank-chambers, Leeds	do.
*Alteration to Stores	Met. Asy. Bd.	Offices, Norfolk House, Norfolk-street, W.C.	do.
*Road-making and Paving	Fulham Vestry	C. Botterill, Town Hall, Walham Green	do.
Road Works	Cockermouth R.D.C.	Mr. Wilson, C.E. Cockermouth	Feb. 3
Medical Officer's Residence, Galbally	Mitchelstown Union	R. Fitzgibbon, Union Offices	do.
Brick Tank at Pumping Station	Sandbach U.D.C.	W. Wyatt Engr. Bryndwr, All Saints, Shrewsbury	do.
Pair Villas, Savile Park, Halifax	.....	M. Hall, Archt. 29, Northgate, Halifax	Feb. 4
*Vagrant Wards, Boiler House, Alterations to Workhouse, &c.	Festiniog Union, North Wales	W. W. Thomas, 15, Lord-street, Liverpool	do.
*Public Conveniences	Broadstairs and St. Peter's U.D.C.	H. Hurd, Council Offices	Feb. 5
*Schools	Margam Sch. Bd.	F. B. Smith, Archt. Port Talbot	do.
Sewerage Works	Radcliffe (Lancs.) U.D.C	Engr. Council's Offices	do.
Sewerage Works	Buckfastleigh U.D.C.	J. Willcocks, Surv. Buckfastleigh	Feb. 7
Offices, House, Sheds, &c.	Hipperholme (Yorks.) U.D.C.	J. F. Walsh, Archt. Halifax	do.
Road Metal	Enniskillen Town Commrs.	W. Cleland, Carlton House, Enniskillen	do.
Painting Works, &c.	Lancs. & Yorks Rly. Co.	Engineer, Hunt's Bank, Manchester	do.
*House and Laundries	H. Hawkes	E. Monson, Grosvenor House, Acton-vale, W.	do.
*Three Dwelling-Houses, Hove	Lord Commrs. of the Admiralty	Watch Room, Hove Coastguard Station	Feb. 8
*Enlarging Fire Stations at Hampstead and Battersea	London County Council	Archt's Dept. 13, Spring-gardens, S.W.	do.
Infirmary and Workhouse, Hylton-road	Sunderland Union	W. & T. R. Milburn, Archts 20, Fawcett-st. Sunderland	Feb. 9
*Drainage and Sanitary Works at Infirmary	Sunderland Union	T. W. Aldwinckle, 1, Victoria-street, S.W.	do.
*Covering Reservoir with Roof, Relining and Covering Reservoir	Teignmouth U.D.C.	C. Jones, Town Hall	do.
*New Infirmary Buildings	Sunderland Union	W. & T. R. Milburn, 20, Fawcett-st. Sunderland	do
Broken Granite and Slag	Spilsby R.D.C.	F. J. Dixon, C.E. Spilsby	Feb. 12
Sanitary Works, Workhouse	Tipperary Union	E. A. Hackett, C.E. Cnty. Surv. Tipperary	Feb. 14
School, Tower Ramparts	Ipswich Sch. Bd.	Corder & Brand, Archts. Tower-street	Feb. 15
*Schools	Edmonton Sch. Bd.	H. W. Dobb, 110, London-wall, E.C.	do.
Brick Tank and Gasholder	Barton-on-Humber Gas Co.	G. H. Hickley, Engr. Gas Offices	Feb. 18
Chapel and School, St. Ives, Cornwall	.....	W. Faull, Fore-street, St. Ives	Feb. 22
*Fireproof Flooring, Stairs, Partitions, Warming, &c. Plant, Laundry Appliances	Southampton Corp.	W. B. G. Bennett, Town Hall	No date
Two Houses, Misterton, Notts	Gilbert & Hill	Eyre & Southall, Archts. Gainsborough	do.
Alterations, &c. to Business Premises, Dublin	.....	Moyers & Sons, Archt. Foster-place, Dublin	do.
Laundry, Starbeck, Harrogate	Provincial Laundries, Ltd.	Oliver & Leeson, Archts. Moseley-st. Newcastle-on-Tyne	do.
Additions, &c. All Saint's Church, Cheadle, Hulme	.....	F. Bindloss, Archt. 4 Chapel-walks, Manchester	do.
Six Houses, Strickland-place, Kendal	Mr. Millward & Others	J. Hutton, Archt. Kendal	do
Church Restoration, St. Michael's, Shap	.....	G. Dale Oliver, Archt. Carlisle	do.
Additions to Police Station, Tamworth	Staffs C.C.	W. H. Cheadle, Archt. Stafford	do.
Six Cottages, Corporation-street	Stafford Indus. Co-op. Soc.	N. Joyce, Archt. Greengate-street, Stafford	do.
Victoria-arcade, Land's-lane, &c. Leeds	.....	Ambler & Bowman, Archts. 9, Park-place, Leeds	do.
Road and Street Works, Fenton Park Estate, Hanley, Staffs.	H. Warrington	R. Scrivener & Sons, Archts. Hanley	do.
Roads and Sewers, Greenhill Park Estate, Harrow	.....	A. Sykes, Archt. 45, Finsbury-pavement, E.C.	do.
Two Shops and House, Fairfield, Manchester	Hyde's Brewery Co.	T. Cook, Archt. 39, Victoria-bldgs. Victoria-street, Manchester	do.
Stables, &c. Maesarddafen, Llanelly	Mrs. Griffiths	W. Griffiths, Archt. Falcon Chambers, Llanelly	do.
School, Ventnor-street, Leeds	.....	W. F. Braithwaite, Archt. 6, South-parade, Leeds	do.
Six Houses, Bank-road, Finedon	C. Lilley	Mosley & Anderson, Archt. Northampton	do.
Station Hotel, Annan, N.B.	.....	F. J. C. Carruthers, Archt. 25, Buccleuch-st. Dumfries	do.
*Clock and Tower (Designs & Estimates)	.....	W. Hanson, C.E. Wantage, Berks.	do.
*Casual Wards, Porter's Lodge, &c. at Workhouse	Atcham Union	J. R. Withers, St. Mary's-court, Shrewsbury	do.
Two Houses, South Moor-lane, Stanley, Durham	Mr. Cumberledge	T. E. Crossling, Archt. Stanley	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Clerk of Works	Acton Sch. Bd.	50s. per week	Jan. 24
*Buildings Inspector	Southend-on-Sea Corp.	104l. per annum	Feb. 5
*Clerk of Works	Edmonton Sch. Bd.	3l. 3s. per week	Feb. 9
*Clerk of Works	Teignmouth U.D.C.		
*Borough Engineer and Surveyor	Derby Corp.	600l. increasing to 750l. per annum	Feb. 13

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. -. Contracts, pp. iv. vi. viii. ix. & x. Public Appointments, pp. xvi. xvii. & xix.

ying at the docks, constituted a "delivery" at the date of the order, or whether delivery took place only when the goods were collected.

Mr. Chamier, counsel for the defendants, contended that by the Sale of Goods Act, the property in the goods in question did not pass until the defendants had in some way appropriated or earmarked them, inasmuch as the delivery order only gave authority to draw generally upon the plaintiff's stock lying at the docks, and contested the argument that in these circumstances the order to collect the goods was a document of title constituting delivery.

His Lordship decided that in a commercial transaction such a document did pass the property, and that the action was not prematurely commenced. In these circumstances he gave judgment for the plaintiff.

Stay of execution with a view to an appeal was refused.

Mr. Peile appeared as counsel for the plaintiff.

INFRINGEMENT OF ANCIENT LIGHTS AT BROMLEY.

THE case of Simon *v.* Powell came before Mr. Justice Romer in the Chancery Division on the 18th inst., it being an action by Mrs. Hannah Maria Simon, a widow, the owner of a messuage and premises on the north side of the Widmore-road, Bromley, Kent, known as Keston Lodge, to recover from the defendant, Mr. Wm. Powell, the owner and

occupier of a house next to Keston Lodge on the west side, and known as Kendall Lodge, damages for alleged infringement of ancient lights, and for an injunction.

Mr. Farwell, Q.C., and Mr. Arthur Powell appeared for the plaintiff, and Mr. Ralph Neville, Q.C., and Mr. Bardswell for the defendant.

It appeared that on the west side of Keston Lodge was an open passage leading from the forecourt to the garden behind, and on the east side of Kendall Lodge, and the plaintiff's case was that there was until recently an open space between the two properties, separated by a partition wall about 5 ft. high. In the west wall of Keston Lodge was a door leading from the basement of the house, and the upper panels of this door were, it was alleged, of glass, and had been so for upwards of twenty years prior to the commencement of this action. The plaintiff said that she and her predecessors for more than twenty years had been in actual uninterrupted enjoyment of the light passing from or over the open space through these glass panels. In November, 1896, the defendant caused to be erected on this open space a brick building which the plaintiff said materially obstructed the access of light to the panels of the door, and thereby the basement of the plaintiff's house had been much darkened, and the value of the house had been diminished. The plaintiff claimed 250*l.* damages, and an injunction restraining the defendant from continuing to obstruct the access of light to her premises.

The defendant denied that the lights of the plaintiff were ancient, and also that the upper panels of the door referred to had been of glass for twenty years, and said that until October, 1892, the door was from top to bottom a solid wooden door, and that there was no glass whatever in its panels or any part of it.

The evidence was of a most conflicting character, and in the result his Lordship found the issue as to ancient lights in favour of the plaintiff, but said that it was not a case for an injunction, as he thought the damage suffered by the plaintiff was small. He, however, awarded the plaintiff 60*l.* damages, and ordered the defendant to pay the costs of the action.

MEETINGS.

SATURDAY, JANUARY 22.

Royal Institution.—Professor Patrick Geddes on "Cyprus." I. 3 p.m.

Edinburgh Architectural Association. — Visit to Glasgow Cathedral.

MONDAY, JANUARY 24.

Royal Institute of British Architects.—(1) Address to Students by the President, Professor Aitchison, A.R.A. (2) Presentation of prizes. 8 p.m.

Surveyors' Institution.—Mr. A. A. Hudson on "Surveyors as Arbitrators." 8 p.m.

Society of Arts (*Cantor Lectures*).—Mr. Cyril Davenport on "Decorative Bookbinding." I. 8 p.m.

Leeds and Yorkshire Architectural Society. — Mr. Nelson Dawson on "Ornamental Hand-wrought Metalwork." 7.30 p.m.

Liverpool Architectural Society. — Mr. R. Ll. B. Rathbone on "Brass and Copper Work." 6 p.m.

TUESDAY, JANUARY 25.

Institution of Civil Engineers.—Mr. W. L. Strange on "Reservoirs with High Earthen Dams in Western India." 8 p.m.

Society of Arts (*Applied Art Section*).—Mr. J. Hungerford Pollen on "Renaissance Woodwork in England." 8 p.m.

WEDNESDAY, JANUARY 26.

Architectural Association (*Discussion Section*).—Mr. E. Herbert on "Architectural Commission: Who Receives It?"

Society of Arts.—Mr. Thomas Potter on "Fireproof Construction of Domestic Buildings." 8 p.m.

THURSDAY, JANUARY 27.

Society of Antiquaries.—8.30 p.m.

Institution of Electrical Engineers.—Major-General Webber on "The Electro-Chemical Treatment of Ores containing the Precious Metals." 8 p.m.

FRIDAY, JANUARY 28.

Institution of Civil Engineers (*Students' Meeting*).—Mr. H. Williams on "Condensing Apparatus." 8 p.m.

SATURDAY, JANUARY 29.

Royal Institution. — Professor Patrick Geddes on "Cyprus." II. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until March 1.

[1896]. 29,247.—CLEANSING CHAMBER IN (METAL) STREET GULLY OR GRATE: *W. F. Crowther.*—The chamber is cast at the end of the grate frame, immediately above the gully-outlet, and fitted with a sand joint lid on top of the outlet, with a locked lid on the surface, the outlet being cast fast to the body of the gully.

[1897]. 2,164.—A CHIMNEY POT: *W. R. Drummond.*—Down draught is prevented by hanging-shutters connected to a ring which opens those that are on the opposite side of the chimney pot to those that are closed by the wind pressure.

3,851.—FLOORS OF ROOMS AND BUILDINGS: *M. Hall.*—A floor or part floor, over which is laid a series of hollow or concave joists, with rubber or springs between the joists and the floor, and a floor laid over the joists.

3,883.—CISTERNS, SINKS, BATHS, AND THE LIKE: *J. Shanks.*—A ball-float to diminish noise at filling of the cistern, with a siphonal discharge apparatus within the cistern, having a bell mo ed by a lever connecting with the closet handle and, for forming round discharge orifices, annular or conical projections which are pressed by counterpart metal rings bolted to the bottom of the cistern, sink, or bath.

4,618.—A MEDIUM FOR DECORATING SURFACES: *Williams & Taylor.*—Treating thin sheets and articles of transparent celluloid, xylonite, &c., with colour, for an inlay or veneer to panels and surfaces of houses, &c.

4,652.—LAYING OF DRAIN-PIPES: *J. G. Cox.*—Chairs or cradles made of clay, earthenware, concrete, &c., support the sections or lengths of pipes, and so leave a space beneath for inspection of the joints and for proper filling.

4,838.—SHUTTER FASTENERS: *G. L. Vogel.*—The combination with hinged shutters of a knuckle-jointed brace, formed in three sections, journalled on the shutters, the middle section interlocking with a brace latch inside the shutter; provision is made for opening the shutters from outside also.

4,960.—SEWER AND DRAIN PIPES: *E. Codling.*—A rest bend or junction made or combined as one piece with a sewer or drain, being fitted and united to the pipe when both are in a plastic state. For metal pipes the parts are moulded together.

12,918.—WINDOW SASH-FASTENERS: *G. H. Hopkins.*—On to the lower sash rail is fixed a small plate formed with two lugs, between which a catch is pivotted. On the vertical bar of the other sash is a plate pierced with rectangular holes, into which the nose of the catch can enter; a spring holds the catch in position.

19,710.—PROTECTION OF METALLIC STRUCTURES FROM FIRE: *K. Kolberg.*—The invention consists in the use of hollow girders and columns, connected with passages or shafts in the masonry work, and inter-connected themselves, so that they can be cooled by a current of air or water.

22,033.—GLASS PLATES, TILES, AND THE LIKE: *T. Krah.*—A machine for pressing glass plates or tiles with bent rims on their reversed side in one operation; the parts which affect the shaping of the bent-over rim are lifted by a raised foot underneath and are then moved aside by levers, thus releasing the bent-over portions from the mould.

24,078.—CALCULATING SCALES: *R. C. Smith.*—The sections being of thin flexible materials are applicable for use upon curved surfaces, and the sliding rules (also flexible) have transparent surface strips for protecting the graduated face from wear and dirt, clamps for holding the parts together slide on the transparent covers.

25,439.—BEVEL GAUGES: *L. Manning.*—A combined gauge-bar and square, the two arms of the latter working through slots in flanges of the bar in which nuts and clamps retain the square in position.

27,228.—WATER COCKS: *J. Merrill.*—For springs in self-closing cocks are substituted a loose bib, and a combined sleeve and valve; on lifting the bib, one also raises the valve, and allows the water to flow out; by another device the usual lever below the bib is replaced with a bent lever working inside the bib.

27,499.—A SASH AND OTHER FASTENER: *A. Hodgson-Brown.*—This consists of a base-plate over which is free to move a ring having a stem crossing from one sash to the other (or from a door to its frame, &c.), and provided at one end with a hook to embrace a headed pin, working in the ring is the flange of a milled-edge disc, which can be turned on an eccentrically-placed pin, whose lower end screws in an internally threaded lug on the base-plate; the eccentrical action of the disc's flange, working within the ring, fastens or releases the window, door, &c.

NEW APPLICATIONS.

For the interval January 1-8.

8, M. J. Adams, Sinks; and 9, Lavatory Basins. 17, Smith & James, Imitation Mica, Marble, and Stone. 19, J. I. Wright, a Chimney-top and Ventilator. 22, W. Oliphant, Water Heating. 33, Clarke's Automatic Flushing Apparatus. 35, E. Compton, the Fixing of Glazing. 37, H. Beech, Self-Closing Doors. 41, Flanders & Carter, Draught and Dust Excluders for Doors. 60, H. Higgins, Cooking Apparatus. 63, T. E. Farrands, an Automatic Disinfectant Supplier. 66, W. W. Wardle; and 593, Blackman Ventilating Company and Others, Moving and Drying Bricks. 78, W. E. Foster, Lock Spindle Handles or Knobs. 84, M. Freshfield, Combined Guard and Gauge for Circular-saw Bench. 102, J. H. McGrouther, Fireproof Doors. 110, W. Peel, Anti-corrosive Composition or Paint for Metal. 118, T. Firth, an Anti-wear Material for Stair-treads, Cellar-flaps, Coal-plates, Coverings to Subways. 137, Shippey & Forbes, the Decoration of Ceramic Ware. 139, F. L. Decarie, Crematories. 149, F. Eichen, Sewage Waste and other Water Purification. 150, B. Boyesen, Endless Chain and Bucket Elevators. 154, West & Raphael, Asphalte Block Paving. 167, C. Strapps, Window Frames and Sashes. 170, Carters, a Solid Corrugated Door Bolt Plate. 171, Harker & Downham, an Oven (for Domestic Fireplaces) to Utilise Waste Heat. 194, C. T. Triesler, a Combined Carpet-tack and "Disk." 199, F. B. Hill; 237, A. C. Rowe; 267, W. C. Daggatt; and 356, L. de L. Wells, Fire-Extinction. 219, A. Don, Steam or Hot-water Boilers for Heating Buildings. 238, Taylor & Frith, Lime or Cement Kilns. 245, J. E. Richards, Automatic Safety-stops for Hoisting Engines. 248, Brand & Fehrmann, Safety Locks and Latches. 268, J. Ricketts; 534, R. Ling; and 87, W. Windham, Lock Nuts and Bolts. 282, A. Wilesmith, Door, Furniture, and other Knobs. 288, J. S. Stevens and others, Suspended Lifts. 317, J. Jones, Water Valves and the like. 321, J. E. Head, Fire-extinguishing Apparatus and Fire Escape. 327, J. E. Farrow, Edges or Trimmings of Paperhangings and Wall Coverings, 330, W. Brett; and 384, W. S. Johnson, Locks. 332, E. Wiltshire, Fire Places and Grates. 340, J. W. Tate, Disinfecting Appliances. 362, C. Armstrong, Buffers and Fittings of Automatic Tilting Tanks for Waste-water Closets. 374, O. H. Wagner Cistern Ball Taps. 392, Smith & Houldsworth, Baths. 399, J. Hutchison, Improvements in Cess-pools. 401, T. W. Styles, Folding Frame for an Awning and Passage. 410, J. Ashford, Heating Apparatus. 427, Bock & Jackson, Excavators. 429, G. Lamotte, Painters' Brushes. 433, P. W. Gates, Construction of Machine Shops and arrangement of Machinery therein. 448, W. Hargrove, Door Springs. 474, E. Hutchinson, Heat Regulator and Soot Annihilator for Domestic Ranges and Fire-places. 475, M. Leithoff, Measuring Rods for use with Boundary and Measuring Stones for Surveying. 476, E. Oehlmann, Gas Ignition and Extinction from a distance. 497, Jones & Sprang, Sanitary-pipe Connexions. 515, G. D. Howard, Scaffold Ledger-board Supports. 540, F. Clarke, Fencing. 552, W. H. Bray, a Window Blind Rack. 555, A. Platt, Apparatus for Soldering, Brazing, and Paint Burning-Off, and the like. 556, A. A. Grist, Syphon Intercepting, Disconnecting, and other Drainage Traps. 572, W. J. Shaw, Traps and Drain Pipes. 581, T. Criswick, a Sliding-Sash Window Fastener. 589, G. P. Davies, Sash and like Fastenings. 597, H. Hargreaves, Heating, Drying, or Airing Apparatus. 609, Callas & Belcher, Spirit Levels; and 610 (the same), Ventilating and Up-draught Cowls.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 10.—By RUMBALL & EDWARDS.	
Barnet.—East Barnet-rd., "The Railway Tavern," f., r. 80*l.*	£3,400
Leicester-rd., "Lyonsdown House," f., r. 30*l.*	410
January 11.—By C. H. BROWN.	
Pimlico.—43, 45, and 47, Hanover-st., u.t. 26 yrs., g.r. 24*l.*	1,075
Westminster.—16 and 18, Dartmouth-st., f.	2,310
30, Great Chapel-st., f., r. 120*l.*	3,030
Pimlico.—9A, Little Ebury-st., u.t. 22 yrs., g.r. 5*l.*	320
Battersea.—135, Meyrick-rd., f., e.r. 30*l.*	290
By J. & W. JOHNSON & Co. (at Masons' Hall Tavern).	
City of London.—Leadenhall-st., "The Tip Tree Tavern," u.t. 19½ yrs., r. 700*l.*, with goodwill..	12,000
January 13.—By C. C. & T. MOORE.	
Peplar.—37 and 38, Rook-st., f., r. 31*l.* 4s.	200
Mile End.—56, Mile End-rd., u.t. 31¾ yrs., g.r. 6*l.* 10s., e.r. 60*l.*	400
Leyton.—72, 74, and 76, Oakdale-rd., u.t. 84½ yrs., g.r. 9*l.*	310
By NEWBON, EDWARDS, & SHEPHARD.	
Hoxton.—58, Gopsall-st., u.t. 38¼ yrs., g.r. 5*l.* 5s.	305
84, Gopsall-st., u.t. 34¼ yrs., g.r. 4*l.*, r. 33*l.*	275
19, Northport-st., u.t. 38¼ yrs., g.r. 4*l.* 10s.	295
20, Ivy-st., u.t. 26½ yrs., g.r. 2*l.* 10s.	135
5, Norris-st., and 2, Holt's-pl., u.t. 21 yrs., g.r. 2*l.* 10s.	225
58, Canal-rd., u.t. 21 yrs., g.r. nil	165
Haggerston.—20 and 22, Clarissa-st., u.t. 21 yrs., g.r. 6*l.*	270
12, Trafalgar-rd., u.t. 41 yrs., g r. 3*l.*	325
Islington.—253, Liverpool-rd., f., r. 45*l.*	650
Ilford.—Albert-rd., f.g.r. 16*l.*, reversion in 98 yrs..	440
4, Bain-villas, u.t. 998 yrs., g.r. 6*l.*, r. 30*l.*	298
Wood Green.—5, Berners-rd., u.t. 74 yrs., g.r. 6*l.*.	200
January 14.—By NORMAN & SON.	
Kilburn.—89 and 91, Kingsgate-rd., u.t. 93¼ yrs., g.r. 32*l.*, e.r. 100*l.*	345

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS

TIMBER.		
Greenheart, B.G. ton	8/0/0	0/0/0
Teak, E.I....load	10/10/0	15/10/0
Sequoia, U.S. ft. cu.	1/8	1/10
Ash, Canada, load	3/5/0	4/10/0
Birch, do.	4/2/6	6/0/0
Elm, do.	4/0/0	5/0/0
Fir, Dantsic, &c..	1/16/0	3/16/0
Oak, do.	2/2/6	3/2/6
Canada	4/15/0	6/0/0
Pine, Canada red	0/0/0	0/0/0
Do. yellow	2/10/0	4/10/0
Lath, Dantsic, fath	4/10/0	5/10/0
St. Petersburg..	5/0/0	6/10/0
Wainscot, Riga, &c., log	2/10/0	3/10/0
Odessa, crown....	2/10/0	3/10/0
Deals, Finland 2nd & 1st std 100	7/10/0	8/0/0
Do. 4th & 3rd ..	7/10/0	8/0/0
Do. Riga	6/0/0	7/0/0
St. Petersburg, 1st yellow	9/10/0	12/0/0
Do. 2nd yellow.	8/10/0	10/0/0
Do. white	8/0/0	10/0/0
Swedish	8/10/0	15/0/0
White Sea	9/0/0	15/10/0
Canada, Pine 1st	19/10/0	25/10/0
Do. do. 2nd	14/0/0	16/10/0
Do. do. 3rd, &c.	6/10/0	10/0/0
Do. Spruce, 1st	9/10/0	11/0/0
Do. do. 3rd and 2nd	7/0/0	8/0/0
New Brunswick	6/10/0	7/0/0
Battens all kinds boards, sq., 1 in. prep. 1st	0/8/6	0/15/6
Do. 2nd	0/7/0	0/12/0
Other qualities—	0/5/0	0/6/6
Cedar, Cuba, ft.	/4	/4½
Honduras, &c.	/3½	/4½
Mahogany, Cuba	/5	/6½
St. Domingo, cargo av.	/4½	0/1/3
Mexican, do. do.	/3½	/4½
Tobasco, do. do.	/4	/6½
Honduras, do.	/4½	/6
Box, Turkey, ton	4/0/0	15/2/0
Rose, Rio	7/0/0	14/0/0
Bahia	6/0 0	12/0/0
Satin, St. Doming.	0/0/5	0/1/0

TIMBER *(continued)*.		
Satin, Porto Rico	0/0/6	0/1/6
Walnut, Italian ..	0/./3	0/0/7
METALS.		
Iron—Pig, in Scotland .....ton	2/5/11	0/0/0
Bar, Welsh, in London	5/15/0	5/17/6
Do. do. at works in Wales	5/10/0	5/12/6
Do. Staffordshire, in London.....	6/5/0	7/10/0
COPPER—British cake and ingot	52/0/0	52/10/0
Best selected ..	53/0/0	53/10/0
Sheets, strong..	57/10/0	58/-/0
Chili bars	49/2/6	0/0/0
YELLOW MTL. lb.	4½d.	5d.
LEAD—Pig Spanish ....ton	12/12/6	0/0/0
English com. bands	13/0/0	0/0/0
Sheet, English 6 lbs. per sq. ft. and upwards ..	13/17/6	0/0/0
Pipe.....	14/7/6	0/0/0
ZINC—English sheet.....ton	20/5/0	0/0/0
Vieille Montagne	21/10/0	0/0/0
Spelter	18/0/0	18/2/6
TIN—Straits	62/1/3	0/0/0
Australian.....	62/12/6	64/2/6
English Ingots..	66/0/0	67/0/0
Banca	61/0/0	0/0/0
Billiton	59/15/0	60/-/0
OILS.		
Linseed .....ton	15/5/0	0/0/0
Cocoanut, Cochin	27/15/0	0/0/0
Do. Ceylon.....	22/0/0	0/0/0
Palm, Lagos	21/15/0	0/0/0
Rapeseed, English pale	27/10/0	0/0/0
Do. Brown	26/0/0	0/0/0
Cottonseed ref....	14/5/0	15/5/0
Oleine.....	13/10/0	14/10/0
Lubricating U.S.	0/5/3	0/7/6
Do. Black	0/5/0	0/6/6
TAR—Stockholm barrel	1/0/3	0/0/0
Archangel	0/12/6	0/0/0
Turpentine	24/0/0	24/5/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

ASHTON-UNDER-LYNE.—For restoring Fern Mills, Ryecroft, after fire. Mr. J. H. Burton, architect, 2, Guide-lane, Hooley Hill:—

Z. Pike	£131	0	John Robinson, Ashton-under-Lyne*..... £112 0
E. Marshall	115	0	
J. Ridyard	112	10	

* Accepted.

ASHTON-UNDER-LYNE. — For the construction of brick bridge, &c., over river Tame, for the Corporation. Mr. J. T. Earnshaw, C.E., Town Hall, Ashton-under-Lyne:—

C. Braddock	£2,844	1	8	Underwood & Bro.,
R. C. Fish	2,681	10	6	Dukinfield* £2,126 6 2
Tate & Gordon	2,311	7	2	

* Accepted.

ASHTON-UNDER-LYNE.—Accepted on a schedule of prices for the construction of a sewer in Cavendish-street, for the Corporation. Mr. J. T. Earnshaw, C.E., Town Hall, Ashton-under-Lyne:—

R. C. Fish, Ashton-under-Lyne

BALLYSHANNON (Ireland).—For the execution of waterworks, Bundoran, for the Ballyshannon Union Guardians. Mr. Jas. Perry, C.E., County surveyor, Galway :—

John Cunningham	£4,972	0	0
Wm. Baird	4,582	3	4
Jas. Galloway & Sons	4,442	0	0
T. J. Dixon	4,272	14	6
M. Green	4,052	18	2
Jas. Brannigan	£3,823	5	0
John M'Nally	3,808	11	3
H. R. Blackburn	3,726	17	9
Jas. M'Kee & Sons, Dungannon*	3,527	9	3

* Accepted.

BIRKENHEAD.—For erecting Well-lane Board Schools. Mr. T. W. Cubbon, architect, Bank-buildings, 54, Hamilton-street, Birkenhead :—

	General Buildings.	Ordinary Asphalte, &c.,	Total.
Brown & Backhouse	£6,832	£661	£7,493
W. H. Forde	6,850	439	7,289
E. Gabbutt	6,628	657	7,285
Kelly Bros.	6,711	536	7,247
P. Bothwell	6,577	532	7,109
J. Merritt	6,519	440	6,959
F. Paterson & Son	6,369	545	6,915
R. Allen	6,490*	485*	6,915*

A supplementary tender amounting to £271 for draining pits on site and levelling grounds has also been provisionally accepted. This work was not included in the general quantities supplied to the contractors.

* Provisionally accepted.

BRIGHTON.—For alterations to schools, York-place, for the School Board. Messrs. T. Simpson & Son, architects, 16, Ship-street, Brighton :—

W. Field & Co.	£6,609	8	
J. Longley & Co.	5,991	0	
W. Brown & Son	5,978	0	
P. Peters & Son	£5,916	0	
Sattin & Evershed	5,444	0	

BUILTH WELLS (Brecon).—For the erection of intermediate schools, for the Governors. Mr. Telfer Smith, architect, Builth Wells. Quantities by Mr. W. Hawker :—

H. Smith	£3,864	0	
E. Davies & Sons	3,812	0	
R. Morgan	3,591	0	
B. Jenkins	3,570	0	
J. M. Jones	3,468	15	
H. Price	£3,250	0	
T. Jones	3,036	15	
A. Meredith, Newbridge-on-Wye*	2,800	0	

* Accepted.

[Architect's estimate, £2,986]

CARDIFF.—For new roads and sewer works on the Penllyn Castle Estate, Canton, Cardiff. Messrs. Veall & Sant, architects, Cardiff :—

Williams & Thomas	£2,670		
Lattey & Co.	2,461		
J. E. Evans	2,236		
James Rich	2,223		
Barnes, Chaplin, & Co.	2,126		
McKay & Davies	£2,104		
E. H. Page	2,073		
Thomas Rees	2,031		
Frank Ashley*	1,852		

* Accepted.

[All of Cardiff]

CRICCIETH (Wales).—For the construction of a sea-wall, Maes Abereisteed, for the Urban District Council. Messrs. T. Roberts & Son, engineers, Portmadoc. Quantities by the engineers :—

T. R. Bishop	£2,570	0	
R. Roberts	2,050	0	
Thomas Bugbird & Son	1,761	0	
William Jones	1,598	0	
John Hunter	1,435	0	
Evan Williams & Co.	£1,471	11	
Griffith Williams	1,390	0	
Owen D. Jones, stone mason, Borth, Portmadoc (accepted)	1,371	5	

[Engineers' estimate, £1,448.]

EARLS HEATON (Yorks).—Accepted for additions at Old Bank. Mr. J. C. Haller, C.E., Savile-road, Savile Town, Dewsbury. Quantities by engineer :—

Masonry.—John Pickersgill, Ossett	£545 10
Joinery.—Thos. Spedding, Chickenley	29 5
Plumbing.—Wm. Hemingway, Earlsheaton	97 17
Slating.—Albert Shaw, Mirfield	119 11
Total	£672 3

FENSTANTON.—For the construction of sewer, for the St. Ives Rural District Council. Mr. H. G. Martin, architect, Littleport, Isle of Ely :—

*F. Giddings, St. Ives, Hunts £229 10

* Accepted at £225.

KINGSTOWN (Ireland).—Accepted for the erection of Municipal offices, &c., for the Commissioners. Mr. Joseph Berry, Borough Surveyor, Town Hall, Kingstown. Quantities by Mr. Sutcell :—

H. Pemberton, Ballybrack £5,719

[Six tenders were received].

LONDON.—For the erection of a factory and offices in Blackfriar's-road, S.E., for the Wicks' Rotary Type-Casting Company. Messrs. Geo. Ashby Lean & Son, architects and surveyors, Palace-chambers, Westminster, S.W. :—

Holloway Bros.	£9,333		
C. Ancell	9,128		
H. B. Gammon	9,100		
Allen & Sons	8,950		
Battley, Son, & Holmes	£8,843		
H. J. Williams	8,587		
Simmonds Bros.	8,523		
L. H. & R. Roberts	8,298		

LONDON.—For the erection of workhouse, &c., Ladywell, Lewisham, for the St. Olave's Union Guardians. Messrs. Newman & Newman, architects and surveyors, 31, Tooley-street, London Bridge, S.E. :—

Foster & Dicksee	£183,700	0	0
Balsam Bros.	180,999	0	0
W. Downs	176,000	0	0
W. Wallis	175,957	0	0
Rudd & Son	171,592	8	7
Leslie & Co., Ltd.	171,300	0	0
Goddard & Sons	£168,400	0	0
Kirk & Randall	168,168	0	0
C. Wall	164,850	0	0
Shillitoe & Co., Bury St. Edmunds*	158,785	0	0

* Accepted.

LONDON.—For pulling down and rebuilding Nos. 20 and 21, King-street, Covent Garden, for Mr Alfred Moss. Mr. F. W. Foster, architect, 41, Bedford-row, W.C. :—

Woodrow	£5,220		
Hilder & Hedge	5,094		
Howard Bros.	5,000		
Patman & Fotheringham.	4,970		
Killby & Gayford	£4,936		
Jerrard	4,853		
Bush (accepted)	4,789		
Whitehead	4,775		

LONDON.—Accepted for sundry repairs and improvements to sanitary arrangements at 22, Pembridge-crescent, Bayswater, for Mr. Harry Chester. Messrs. Lauder & Bedells, surveyors, 6, John-street, Bedford-row :—

Watson	£265	10	
Veers	225	8	
Lintern	£221	0	
Sobey (accepted)	219	0	

NEWPORT.—For the rebuilding of shop premises, Nos. 143 and 144, Commercial-road, Newport, Mon., for Mr. J. Phillips. Messrs. Morgan & Hodge, architects and surveyors, Newport and Cardiff :—

James Davies	£2,600		
John Moore	2,600		
T. G. Diamond	2,599		
John Linton	2,590		
Thomas Westacott	2,567		
Charles Reed	2,550		
D. J. Davies	£2,547		
W. A. Linton	2,511		
F. Baglow	2,495		
Geo. F. Davies	2,430		
William Moore*	2,384		

* Accepted.

YATTON.—Accepted for additions to Claverham House, near Yatton, for Mr. L. R. Price. Mr. C. A. Rowley, architect, 26, Nicholas-street, Bristol :—

Cowlin & Sons, Bristol £420

TO CORRESPONDENTS.

J. C. W. (below our limit).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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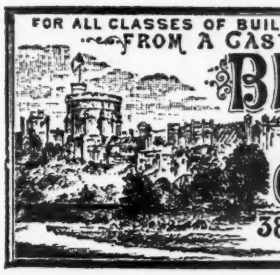

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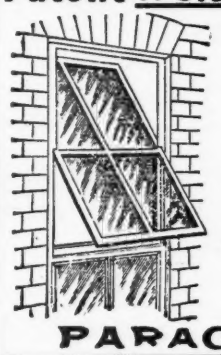

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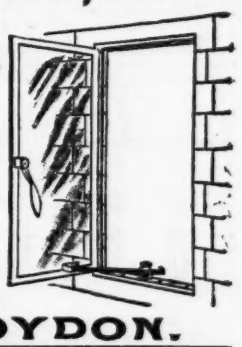

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Registered Telegraphic Address, 'THE BUILDER,' LONDON.

THE INDEX and TITLE-PAGE for VOLUME LXXIII. (July to Dec. 1897) were given as a supplement with the number for Jan. 8 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C., free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to the advertiser the week after publication.

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YOUNG ARCHITECT, A.R.I.B.A., DESIRES to ASSIST others in the PREPARATION of DRAWINGS at his own office. G. SCORER, 28, Newman-street, W.

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PARTNERSHIP.—An ARCHITECT and SURVEYOR of long practical experience, with a well-established provincial practice, is desirous of extending it by entering into PARTNERSHIP with a London architect, or otherwise amalgamating as may be agreed upon. All communications treated in strict confidence.—Address, Box 908, Willings' Advertisement Offices, No. 125, Strand, W.C.

QUANTITY SURVEYOR, in practice, wishes to join an Architect in SHARE OF OFFICES in City, either E.C. or W.C. district.—State accommodation, rent, &c. to SURVEYOR, Box 171, Office of "The Builder."

CIVIL SERVICE COMMISSION.—Forthcoming EXAMINATION.—ENGINEER STUDENTS in the Navy (14 to 17), 15th March. The date specified is the latest at which applications can be received. They must be made on forms to be obtained, with particulars, from the SECRETARY, Civil Service Commission, London, S.W.

SOUTH METROPOLITAN SCHOOL DISTRICT.

The Managers invite TENDERS from professional valuers, for VALUING the following Properties belonging to this District, at Sutton, Surrey, and at Witham, Essex.

(*a*) The buildings of the Brighton-road School, Sutton.
(*b*) The arable farm and meadow land, and all other lands belonging to that School other than that enclosed for play yards, and the flower gardens and lawns in front of the Officers' apartments.
(*c*) The buildings and land of the Banstead-road School at Sutton.
(*d*) The buildings and land of the School at Witham.

A separate valuation of the properties marked respectively *a*, *b*, *c*, *d*, will be required.

The Tenders must state a fixed or specific sum for the valuation of each separate property.

No travelling or other expenses will be allowed.

The respective properties and plans of them may be seen upon application to the Superintendents of the Schools

Sealed Tenders, marked "Tender for valuing," to be addressed to The Managers of the South Metropolitan District Schools, Brighton-road, Sutton, Surrey, must be delivered not later than MONDAY, 31st inst.

By order,
HENRY BURGESS,
Clerk to the Managers.

South Metropolitan School District,
Brighton-road, Sutton, Surrey.
January 10th, 1898.

TEIGNMOUTH URBAN DISTRICT COUNCIL.
CLERK OF WORKS.

The above named Council are desirous of obtaining the SERVICES of a Competent Person to act as CLERK of WORKS in the carrying out of certain work in connexion with Covering two Reservoirs with concrete roofs.

Further information to be obtained of Mr. C. JONES, the Surveyor and Engineer of the Council, at the Town Hall, Teignmouth.

Sealed applications, stating age and salary required, enclosing copies of not more than three testimonials of recent date, endorsed "Clerk of Works," to be delivered at the Clerk's Office, at the Town Hall, Teignmouth, at or before TEN o'clock a.m. on WEDNESDAY, the 9th day of FEBRUARY, 1898.

Canvassing members will disqualify.

By order,
W. R. HALL JORDAN,
Clerk.

Teignmouth,
January 15th, 1898.

BOROUGH of SOUTHEND-ON-SEA.
BUILDINGS INSPECTOR.

The Corporation invite APPLICATIONS for the APPOINTMENT of BUILDINGS INSPECTOR at a salary of 104l. per annum.

The person appointed will be required to supervise the erection of new buildings, and to see that the Bye-laws in force within the Borough with respect to new streets and buildings, are complied with, and it is essential that he should be practically acquainted with building construction, and have a thorough knowledge of the model Bye-laws of the Local Government Board under the Public Health Act, 1875.

Applications, accompanied by copies of three recent testimonials which will not be returned) and stating age, qualifications, experience, and where at present engaged, to be delivered at the office of the undersigned, on or before WEDNESDAY, the 2nd of FEBRUARY.

Canvassing members of the Town Council will be a disqualification.

By order,
WILLIAM GREGSON,
Town Clerk.

Southend-on-Sea,
January 14th, 1898.

BOROUGH of DERBY.
BOROUGH ENGINEER AND SURVEYOR.

The Corporation invite APPLICATIONS for the Post of BOROUGH ENGINEER and SURVEYOR.

Salary, 600l. per annum, increasing by 50l. per annum to 750l.

The Corporation provide offices, assistants, instruments, and stationery.

The person appointed to devote the whole of his time to the duties of the office. An abstract of the principal duties and conditions of appointment may be obtained on application to the undersigned.

Applications, stating age, present occupation, and qualifications, with copies of not more than three recent testimonials, to be sent or delivered to the undersigned, endorsed "Borough Engineer and Surveyor," not later than SATURDAY, 12th FEBRUARY, 1898.

H. F. GADSBY,
Town Clerk.

Town Hall, Derby,
January 18th, 1898

EDMONTON SCHOOL BOARD.

WANTED, a CLERK of WORKS in connexion with the erection of a large new School at Eldon-road, Lower Edmonton, under the superintendence of H. W. Dobb, Esq. of 116, London Wall, E.C.

Salary three guineas per week.

Applications, with not more than three testimonials, one of which must be as to personal character, to be delivered to the undersigned not later than NOON, FEBRUARY 5th, 1898.

Canvassing will disqualify.

JOHN MOULE,
Clerk to the Board.

School Board Offices,
Upper Edmonton.

SCHOOL BOARD for ACTON.

CLERK of WORKS WANTED for the Beaumont Park Schools (enlargement).

Salary, 50s. per week.

Applications, stating experience, age, &c. with copies only of testimonials (which will not be returned), addressed to the Clerk, School Board Office, Acton, W. and endorsed "Clerk of Works," to be received by MONDAY, 24th JANUARY, 1898, or at latest by first post on TUESDAY, 25th.

W. A. BROWN,
Clerk to the Board.

January 17th, 1898.

QUANTITY SURVEYOR'S ASSISTANT.—WANTED a thoroughly capable Man to take-off and measure-up on own responsibility. Must be quick, accurate, and have had first-class experience.—State salary and fullest particulars, Box 266, Office of "The Builder."

N.B.—Vacancy for an Articled Pupil.

QUANTITY SURVEYOR'S ASSISTANT WANTED. Quick at working up and general knowledge of drawings, &c. Must have been in surveyor's office before.—State age, references, and salary required, in own handwriting, to H. & B. 30, Bishopsgate-street Without, London, E.C.

DRAUGHTSMAN WANTED at once. Experienced in the preparation of plans for moderate-sized villas, details, and specifications.—Write, stating age and salary required, to "B." Chas. Tayler & Co.'s Advertisement Offices, 154 to 157, Fleet-street, E.C.

DRAUGHTSMAN REQUIRED, able to set out ornamental ironwork from small sketches.—Apply by letter, with full particulars as to experience and salary expected, A. J. 22A, Margaret-street, W.

ARCHITECTURAL DRAUGHTSMAN WANTED.—Apply, J. J. LACHLAND, Water Department, Town Hall, St. Helen's

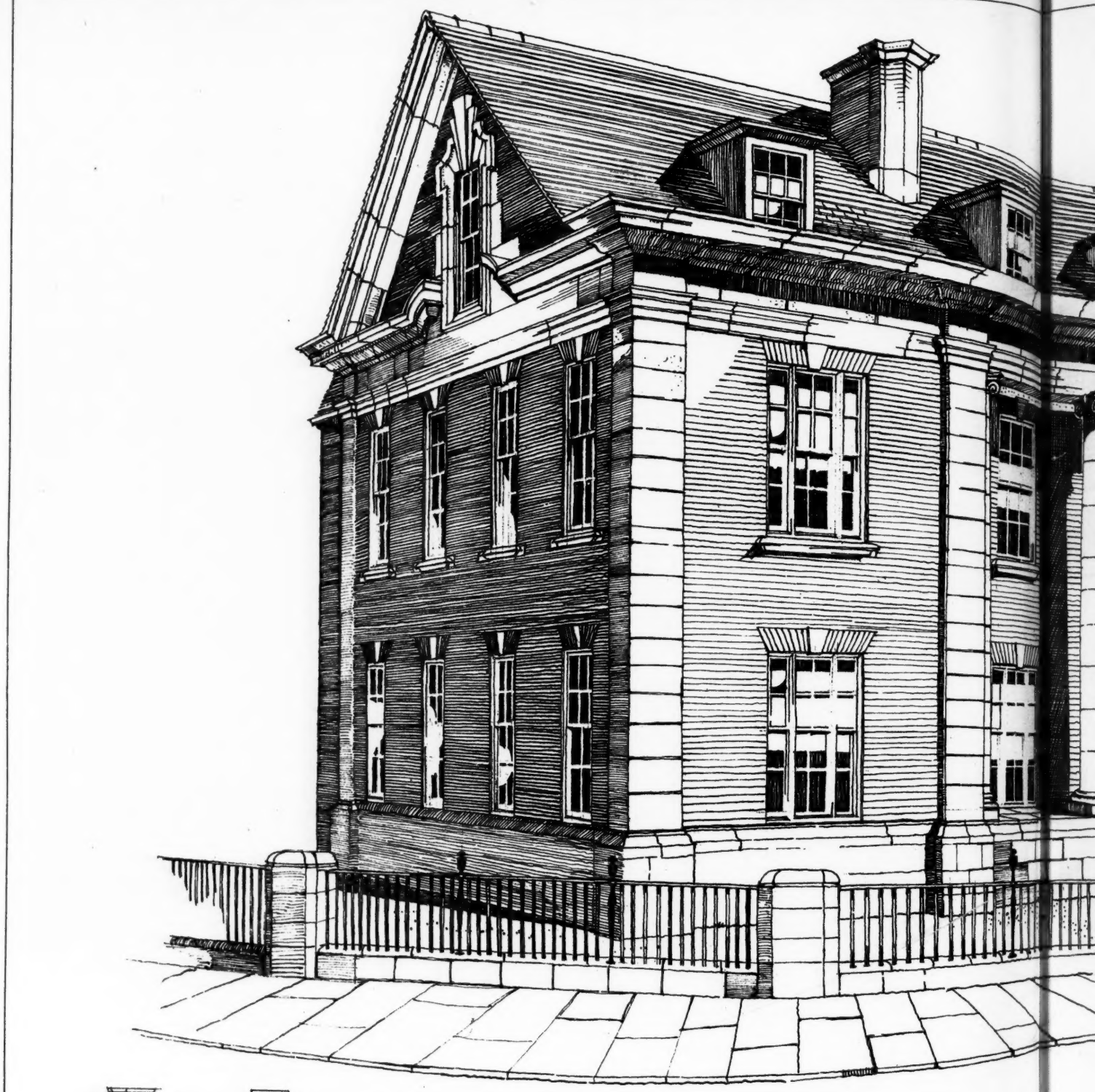
ARCHITECTURAL DRAUGHTSMAN WANTED. Good. Temporary.—Apply by letter only, HENRY OUGH & SON, 84, St. Paul's Churchyard, E.C.

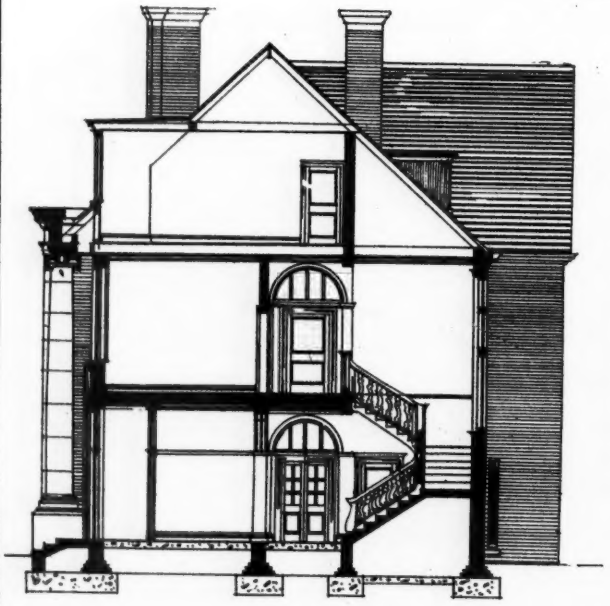
LONDON ARCHITECT REQUIRES SENIOR ASSISTANT. Must be practical and quick worker. One used to public-house work desirable.—Box 268, Office of "The Builder."

ARCHITECT'S ASSISTANT, with view of partnership, REQUIRED by architect in practice on South Coast. Must be first-rate practical draughtsman and take entire charge of this branch. Strictest references.—Apply in first instance, with full particulars, to Box 169, Office of "The Builder."

ARCHITECT'S ASSISTANT WANTED, at once. Must be a good designer. State age, salary, and experience, to Box 274, Office of "The Builder."

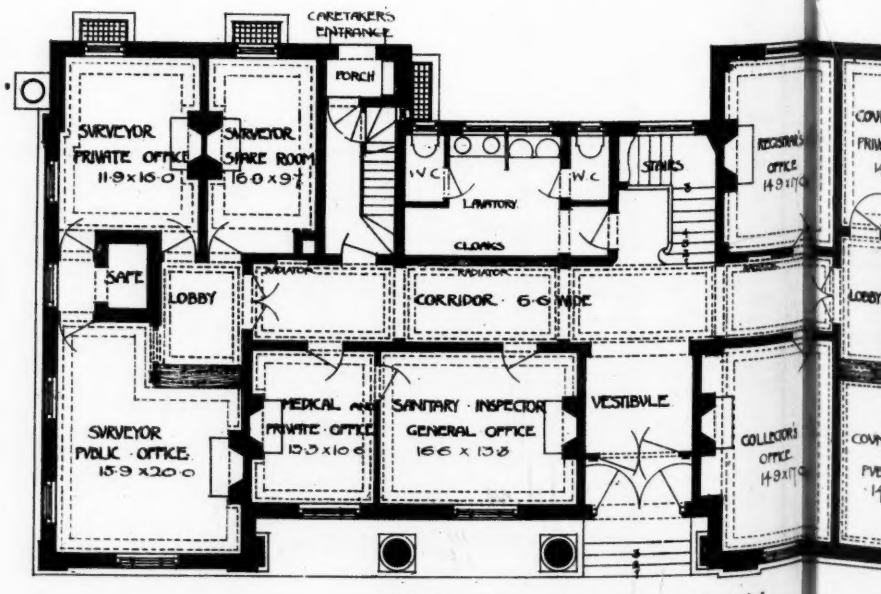
ARCHITECT'S JUNIOR ASSISTANT WANTED. Must be a neat and accurate draughtsman, and accustomed to the taking of measurements of old buildings, and similar work.—Address, Box 270, Office of "The Builder."





CROSS SECTION.

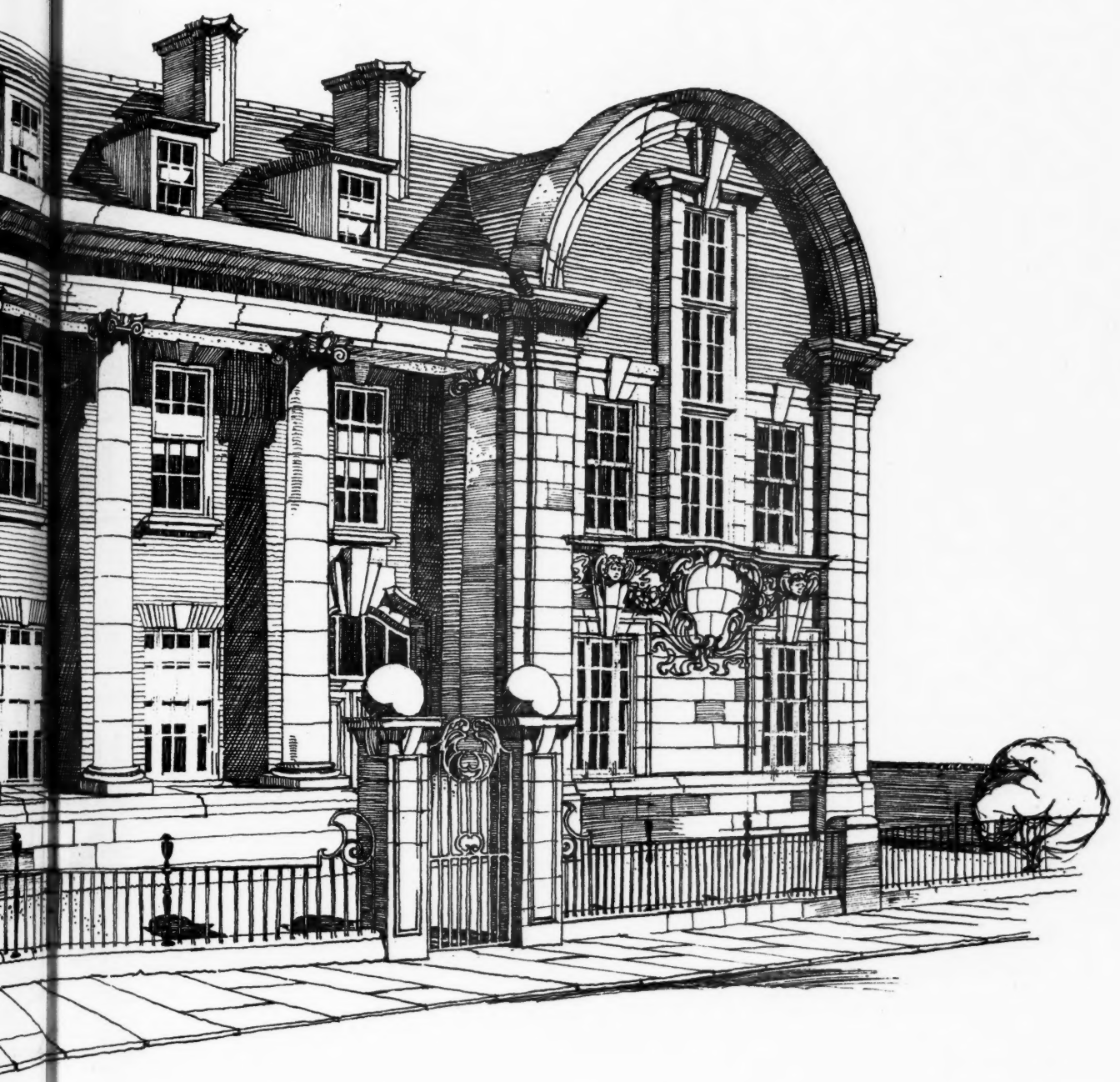
SCALE OF FEET FOR SECTIONS.

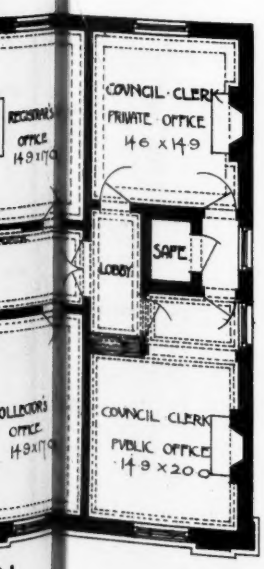


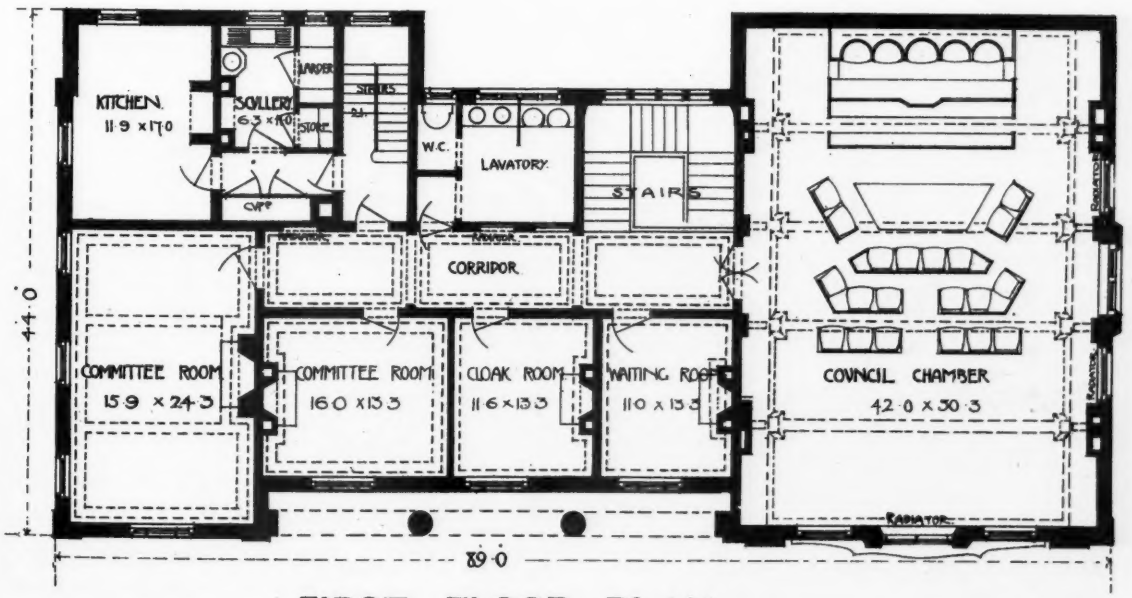
GROVND FLOOR PLAN.

SURBITON MUNICIPAL BUILDINGS COMPETITION: DESI

By Messrs. W[illegible]eris &





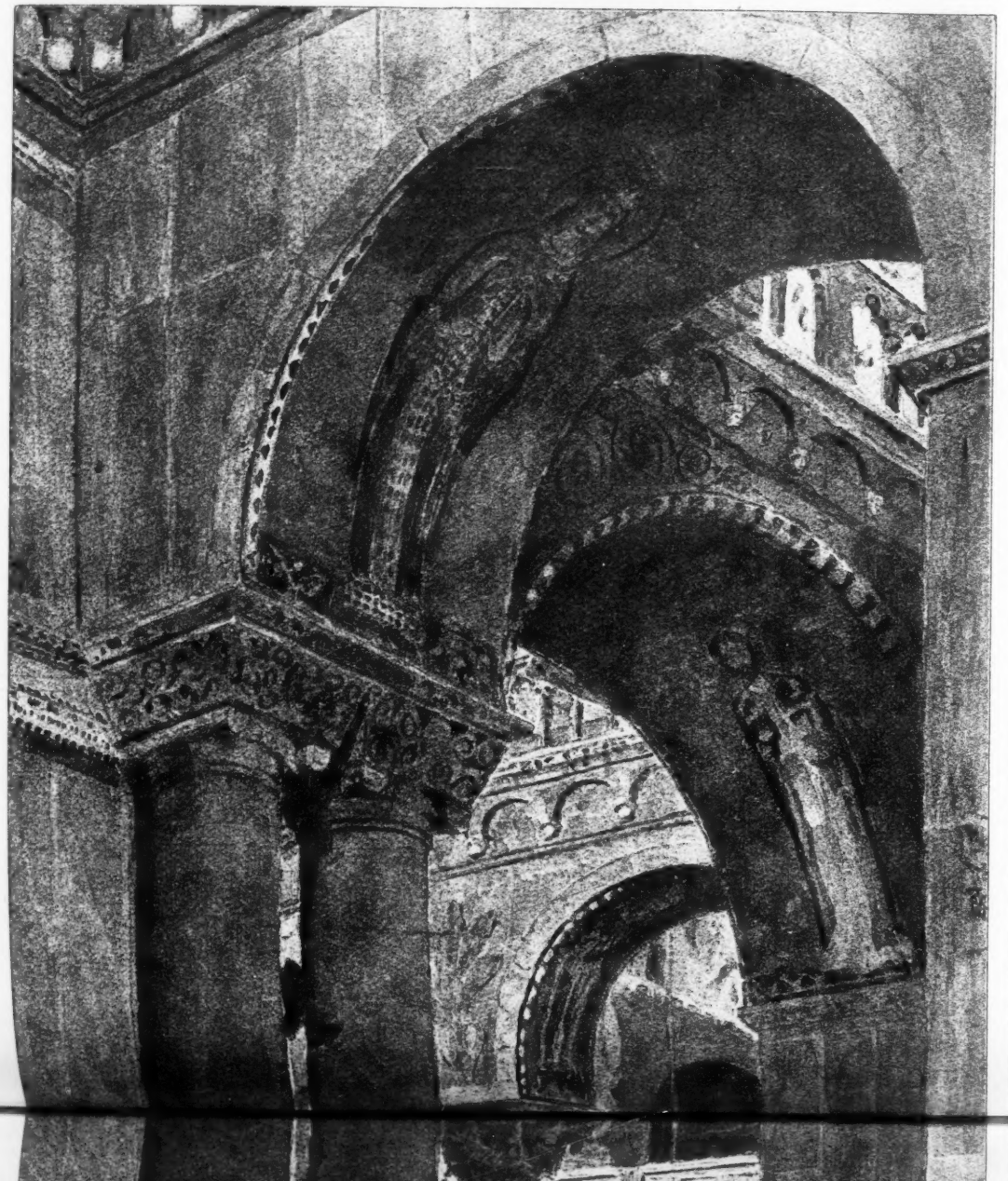


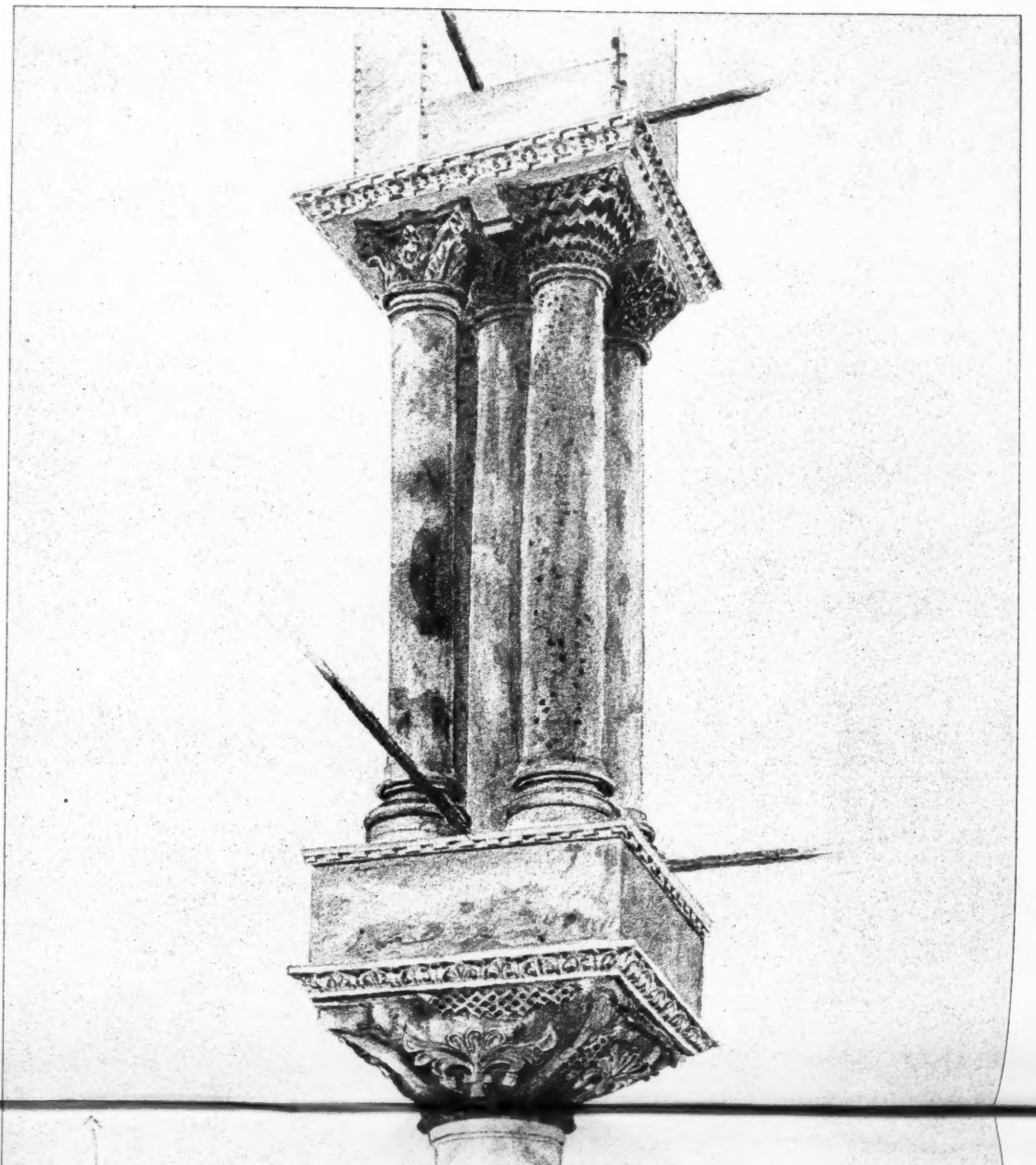
FIRST FLOOR PLAN.

SCALE OF FEET.

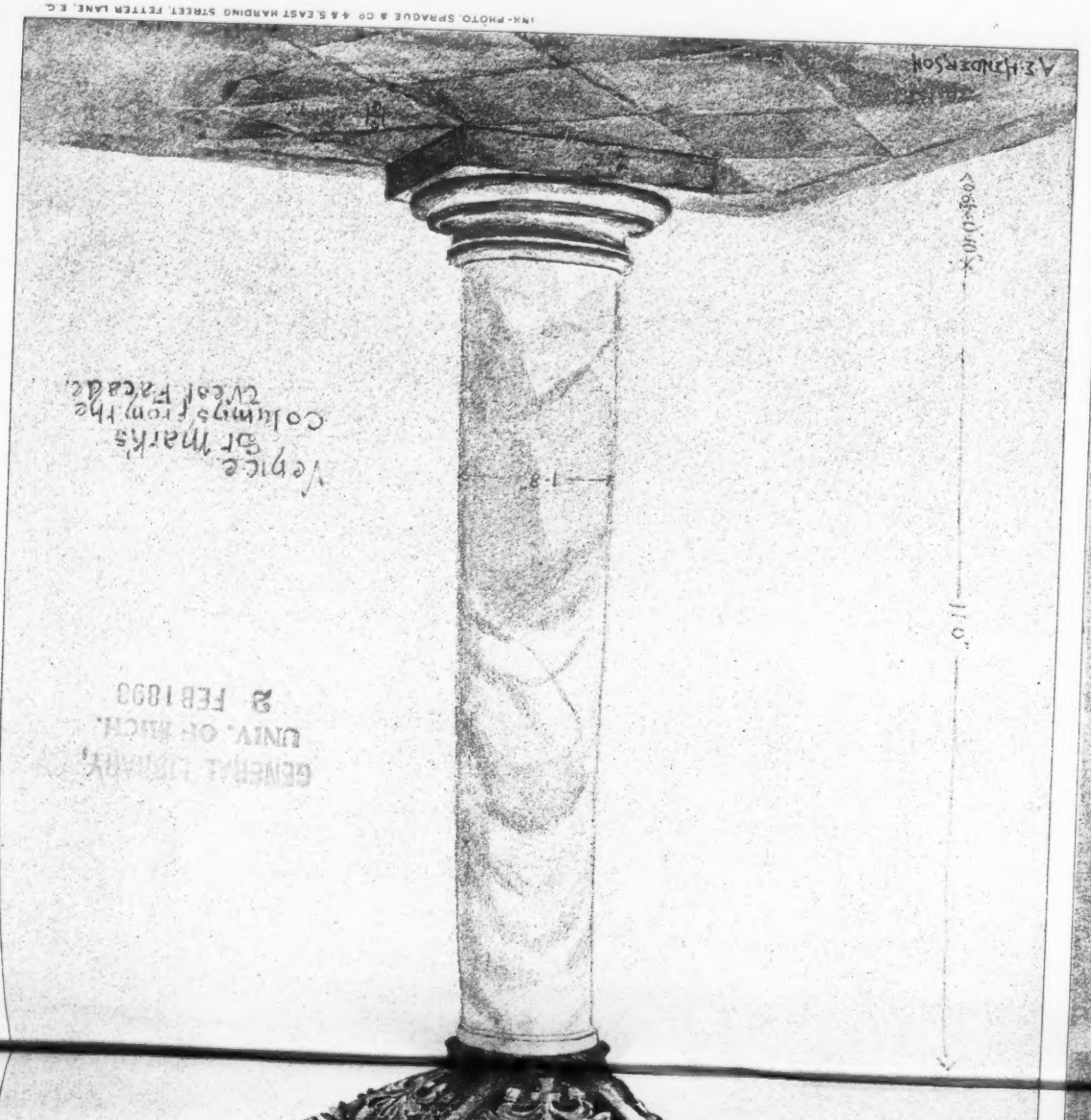
PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PETITION. DESIGN PLACED FIRST BY THE ASSESSOR.
SSRS. W[illegible]ERIS & EAST



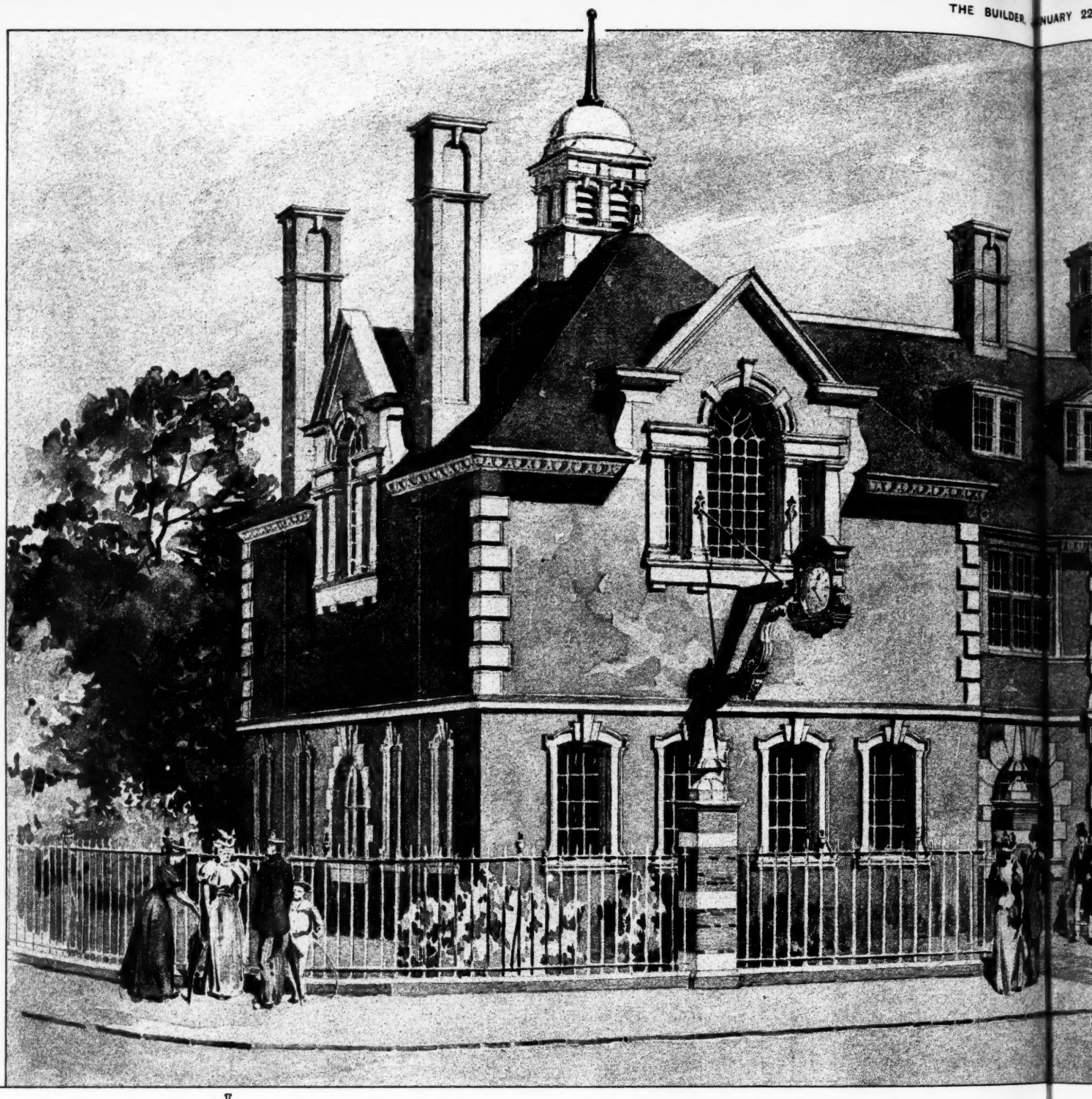


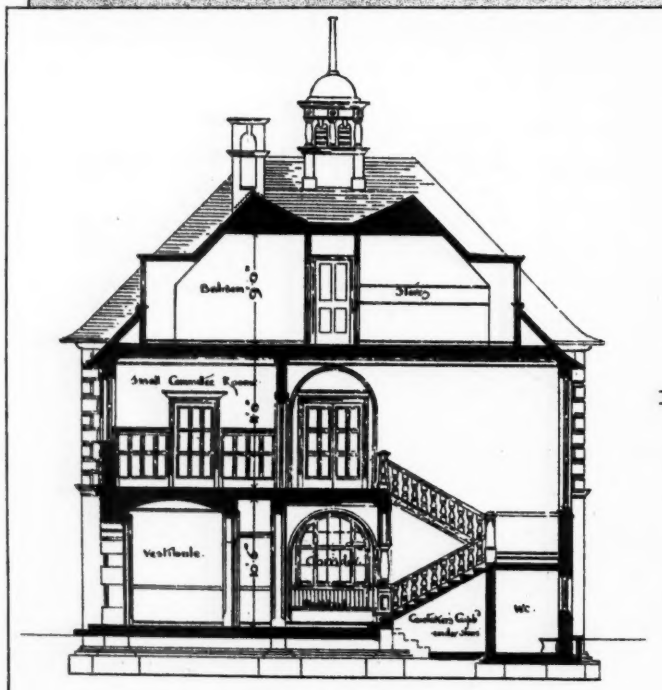
INK-PHOTO. SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

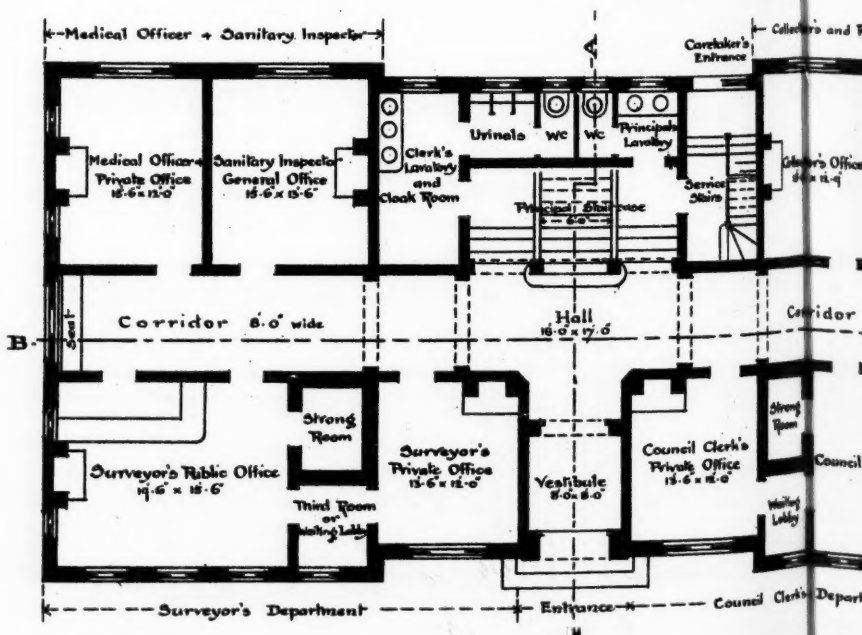


Venice
Br 1marks
Columns from the
Great Facade.

GENERAL LIBRARY,
UNIV. OF MICH.
2 FEB 1893

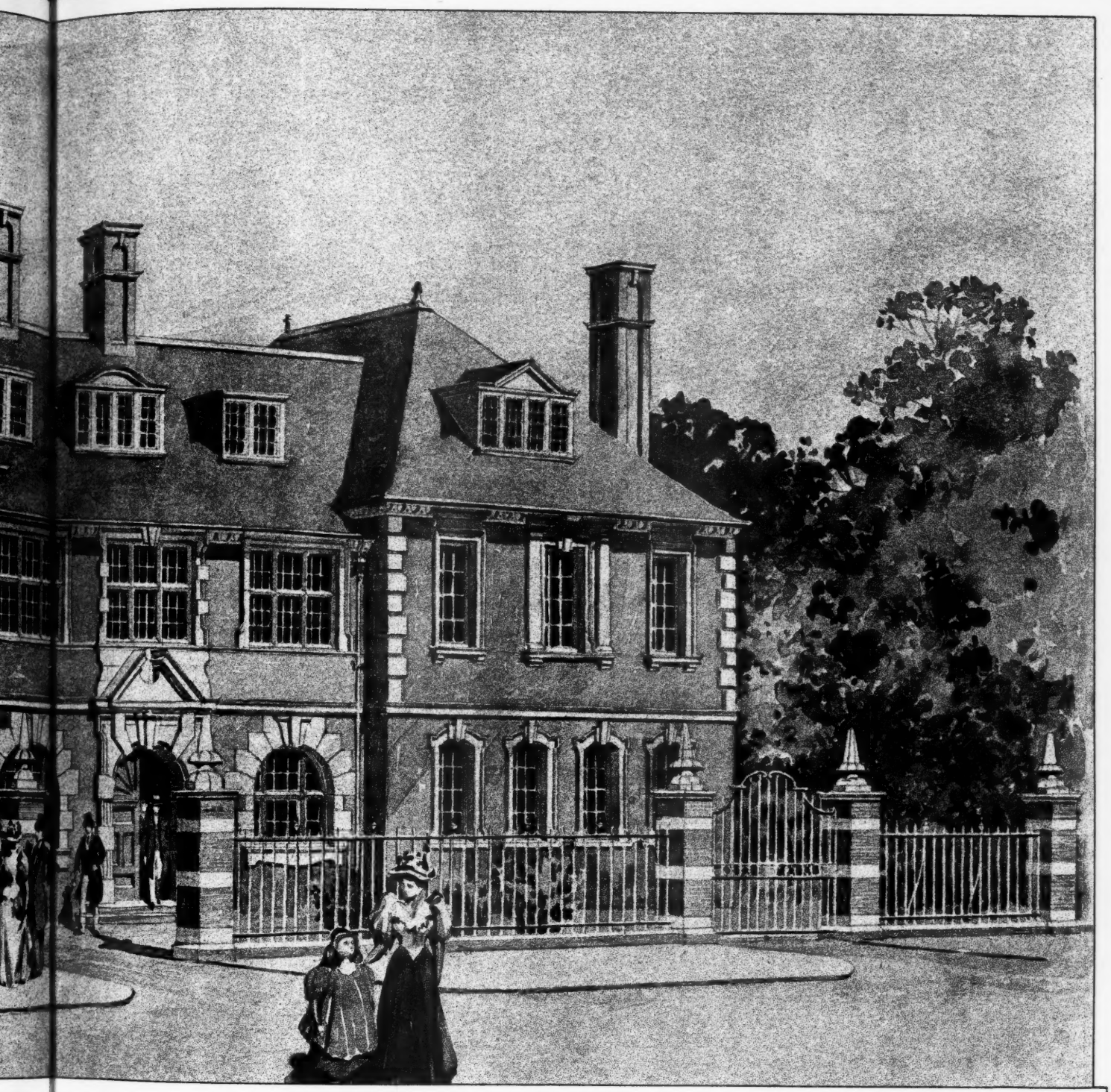


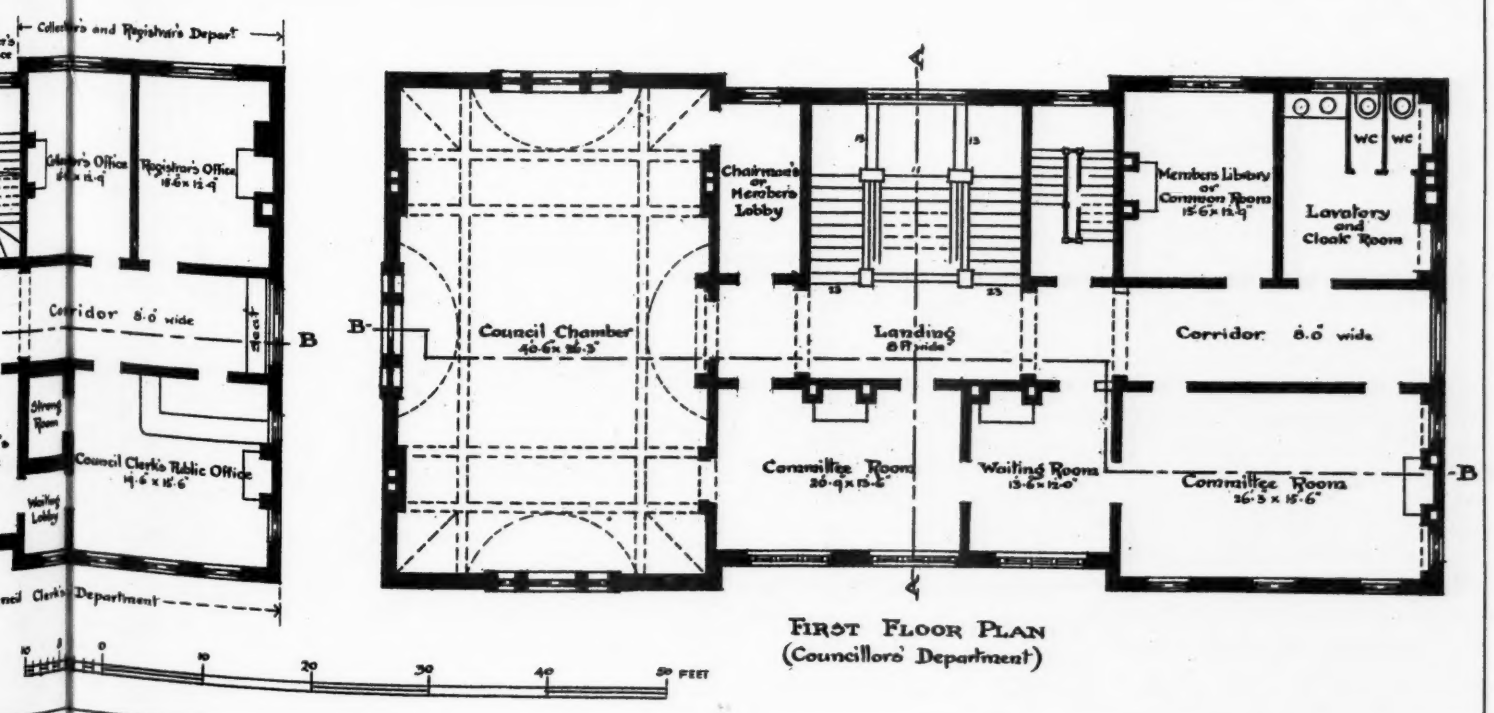




SURBITON MUNICIPAL BUILDINGS COMPETITION: DE

By Messrs. Walter E. Hewitt, A.R.I.B.A., and A

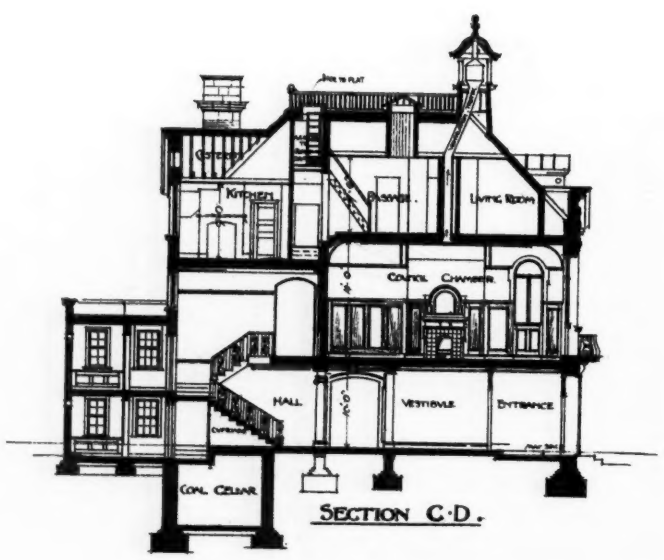




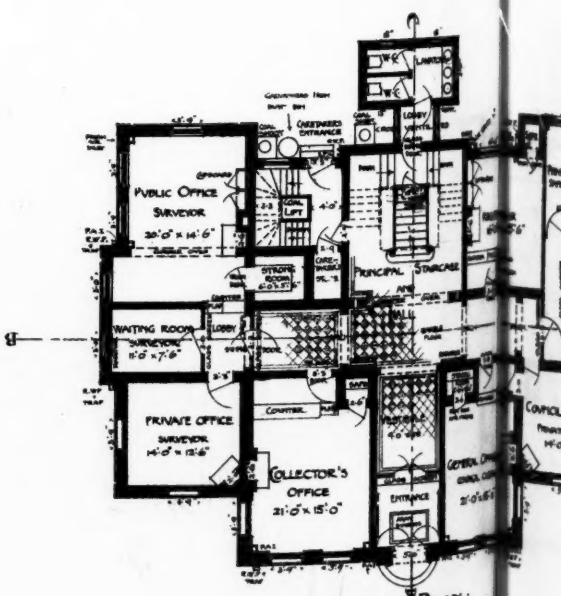
FIRST FLOOR PLAN
(Councillors' Department)

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PETITION: DESIGN PLACED THIRD BY THE ASSESSOR.
A.R.I.B.A., AND ARTHUR H. RYAN-TENISON, A.R.I.B.A.



SECTION C·D.

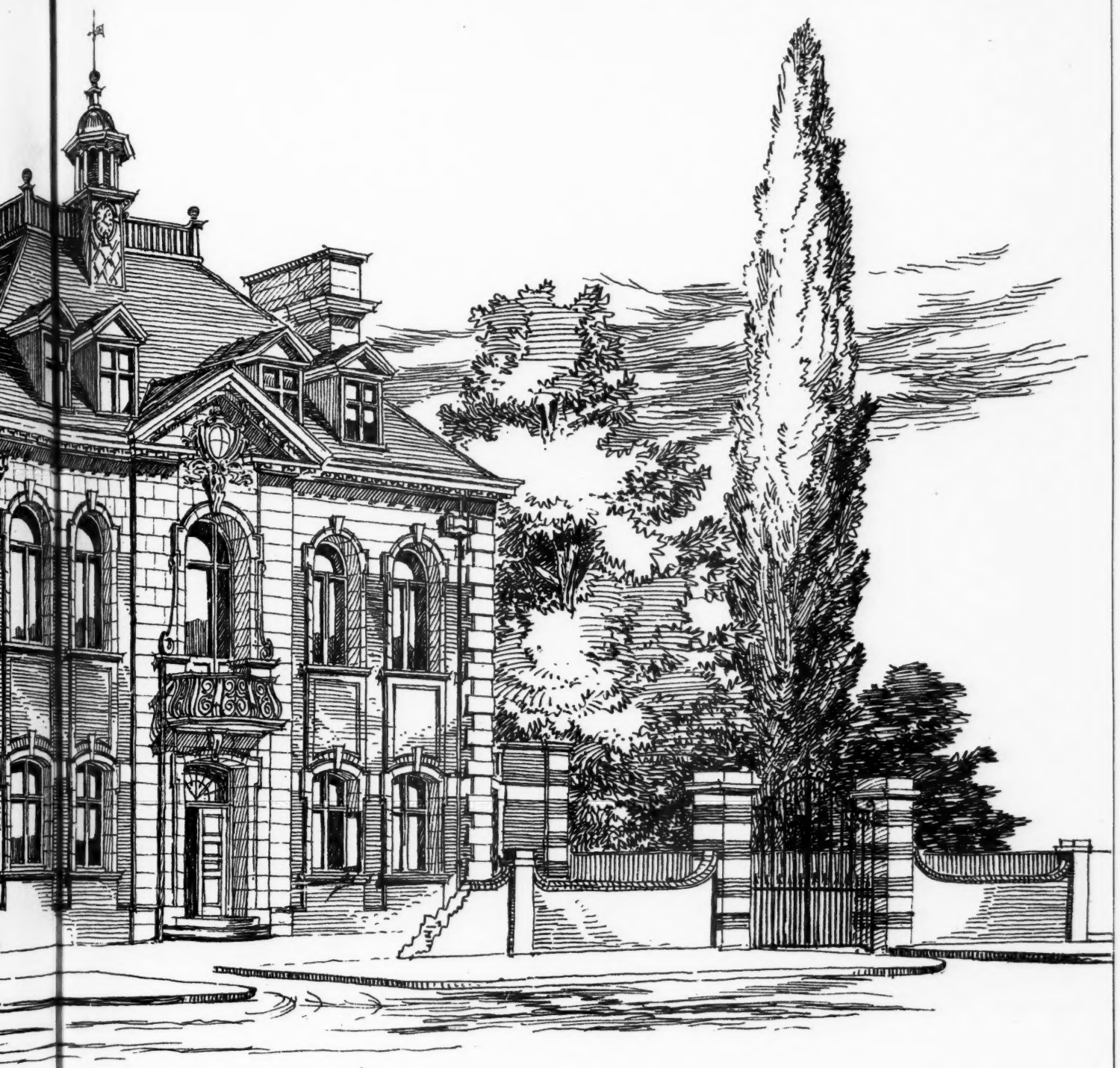


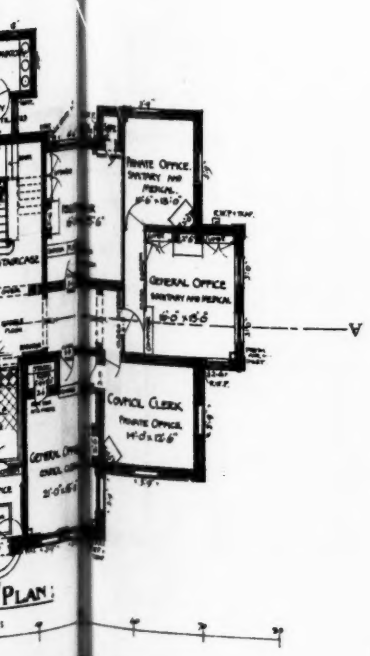
GROUND PLAN.

SCALE OF FEET:

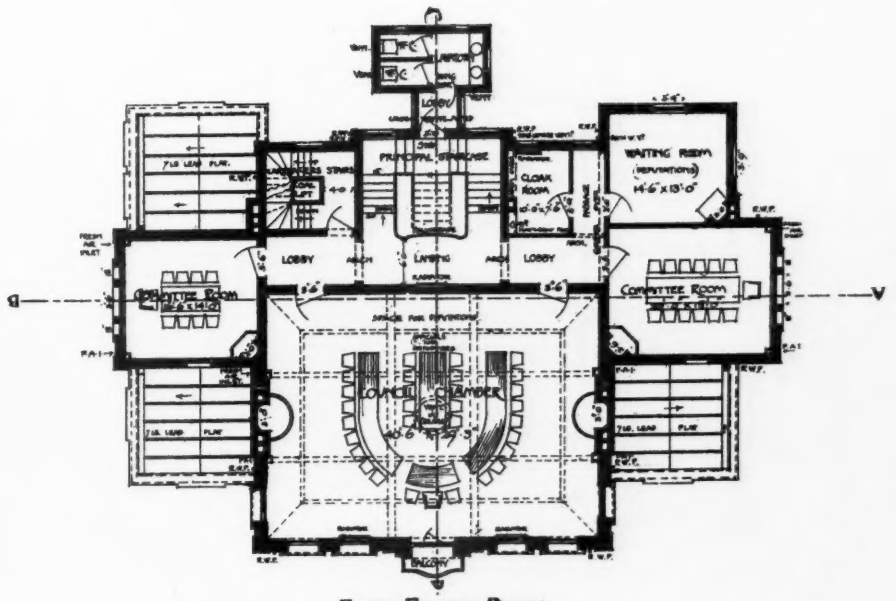
SURBITON MUNICIPAL BUILDINGS COMPETITION: SELECTED

MESSRS. FORSYTH & [illegible]ULE, A





PLAN.



FIRST FLOOR PLAN

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

TION: SELECTED DESIGN (PLACED SECOND BY THE ASSESSOR)

FORSYTH & MOULE, ARCHITECTS